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**SAMSO, 31 Jan 1980**

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AD844 396



GENERAL REPORT SUMMARY SHEET

COMPONENT/PART NAME PER GENERIC CODE <b>TRANSDUCERS-PRESSURE, GAS, VOLTAGE</b>		2. PROGRAM OR WEAPON SYSTEM <b>APOLLO</b>	ACCESS. NO. <b>C9550</b>
4. ORIGINATOR'S REPORT TITLE <b>STEAM DUCT PRESSURE TRANSDUCER</b>		5. ORIGINATOR'S REPORT NO. <b>DTD-191</b>	3. DAY MO. YR. TEST COMPL 1 68
ECS ITEM 8.17		6. TEST TYPE, ETC. <b>DEVELOPMENT</b>	REPT. COMPL 18 1 68

7. THIS TEST (SUPERSEDES) (SUPPLEMENTS) REPORT NO.:

8. OUTLINE, TABLE OF CONTENTS, SUMMARY, OR EQUIVALENT DESCRIPTION:

MFGR: AIRESSEARCH

The present Item 8.17 Steam Duct Pressure Transducer (P/N 837036-1) has been determined to be unacceptable because of its inability to maintain a stable calibration. A majority of the calibration shift problems have occurred during acceptance testing, but some units have been rejected after use in the field and during qual testing. The reasons for the shifts have been:

- . Mechanical instability of the sensing diaphragm.
- . Sensitivity to minor overpressurization of the sensing diaphragm.
- . Corrosion of the diaphragm and the "E" core pole pieces caused by the moisture of the pressure media.
- . Gain shifts caused by internal electronic instability.
- . Calibration changes caused by pressure inlet fitting torque.

Because of the basic design problems associated with this unit it was deemed impractical to attempt to modify this design to obtain an acceptable transducer.

AiResearch has undertaken an extensive survey of other transducer manufacturers in an attempt to find an acceptable replacement. Test samples were obtained from six manufacturers that were judged to have a workable approach to this problem. A developmental test program was initiated and tests were conducted on the new transducers. Preliminary results of this testing have been transmitted to North American Rockwell by AiResearch Report No. DTD-183, dated 16 October 1967. Since that report, developmental testing has continued, and the development test results on one transducer type are very encouraging. The transducer is manufactured by the Pace-Wiancko Division of the Whittaker Corporation, North Hollywood, Calif. The results of this testing have indicated that the Pace-Wiancko transducer will meet or exceed the requirements for this application. As a result of the encouraging test results on the Pace-Wiancko transducer, a EDCP will be submitted to incorporate this transducer into the ECS system. Testing, however, will continue on both the Pace-Wiancko and transducers from other suppliers.

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10 MAY 1968

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DEVELOPMENTAL DATA TRANSMITTAL  
STEAM DUCT PRESSURE TRANSDUCER

ECS ITEM 8.17  
NAR/SD PROJECT APOLLO  
NAR P.O. M5J7XAZ-450029A

Report No. DTD-191

18 January 1968

Prepared by R. E. Durham

Approved

J. P. Dahl  
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H. Nicolello  
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No. of Pages 84

APPENDIX A 16 Pages

## CONTENTS

	<u>Page</u>
INTRODUCTION	1
SUMMARY	2
TEST SPECIMENS	2
TEST DESCRIPTIONS	3
Transducer 837036-2, S/N 22319 Testing	3
Transducer 837036-2, S/N 22320 Testing	4
Transducer 837036-2, S/N 22321 Testing	6
Transducer 837036-2, S/N 22322 Testing	7
Transducer 836706-2, S/N 22323 Testing	7
CONCLUSIONS AND RECOMMENDATIONS	9
TABLE I	10
FIGURES	13
APPENDIX A - 16 pages	A-1



AIRESEARCH MANUFACTURING DIVISION  
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DTD-191  
Page i

DEVELOPMENTAL DATA TRANSMITTAL  
STEAM DUCT PRESSURE TRANSDUCER  
ECS ITEM 8.17  
NAR/SD PROJECT APOLLO  
NAR P.O. M5J7XAZ-450029A

INTRODUCTION

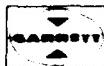
The present Item 8.17 Steam Duct Pressure Transducer (P/N 837036-1) has been determined to be unacceptable because of its inability to maintain a stable calibration. A majority of the calibration shift problems have occurred during acceptance testing, but some units have been rejected after use in the field and during qual testing. The reasons for the shifts have been:

- Mechanical instability of the sensing diaphragm.
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- Gain shifts caused by internal electronic instability.
- Calibration changes caused by pressure inlet fitting torque.

Because of the basic design problems associated with this unit it was deemed impractical to attempt to modify this design to obtain an acceptable transducer.

AIResearch has undertaken an extensive survey of other transducer manufacturers in an attempt to find an acceptable replacement. Test samples were obtained from six manufacturers that were judged to have a workable approach to this problem. A developmental test program was initiated and tests were conducted on the new transducers. Preliminary results of this testing have been transmitted to North American Rockwell by AIResearch Report No. DTD-183, dated 16 October 1967. Since that report, developmental testing has continued, and the development test results on one transducer type are very encouraging. The transducer is manufactured by the Pace-Wlancko Division of the Whittaker Corporation, North Hollywood, California. The results of this testing have indicated that the Pace-Wlancko transducer will meet or exceed the requirements for this application. As a result of the encouraging test results on the Pace-Wlancko transducer, a EDCP will be submitted to incorporate this transducer into the ECS system. Testing, however, will continue on both the Pace-Wlancko and transducers from other suppliers.

This report presents a summary of the development tests completed to date, on the Pace-Wlancko transducers. The testing was conducted from August 1967 through January 1968.



## SUMMARY

Based on the successful completion of the developmental testing at this time a design decision has been made to submit an EDCP to incorporate the improved Pace-Wiancko into the steam duct pressure transducer application. This transducer is identified by Part Number 836706-2.

The decision is based on the results of the development tests and design investigations completed to this date on five test specimens. The Pace-Wiancko design incorporates a stretched diaphragm that has proved to be exceptionally stable during pressure cycling tests. No major problems were encountered either with moisture or electronic instability. The transducer is insensitive to fitting torque since the pressure fitting is installed with a torque of 150 lb-in. and securely locked with a set screw.

To further increase the confidence level in this design, development tests are continuing. Further tests will include water testing, corrosive contaminant oxygen-humidity testing (CCOH), continued steam environment testing and disassembly.

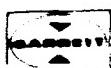
## TEST SPECIMENS

Five development test transducers were obtained from Pace-Wiancko for this testing. The units are identified by the following serial and part numbers:

<u>Serial No.</u>	<u>Part Number</u>
22319	837036-2
22320	837036-2
22321	837036-2
22322	837036-2
22323	836706-2*

Initial delivery was taken on Part No. 837036-2 Serial Nos. 22319 through 22322, and testing was started. Tests on those units indicated that some design changes were desirable in order to improve the transducer stability. The design changes as discussed later in this report were:

1. Modification of the "E" core magnetic circuit to reduce magnetic circuit leakage.
  2. Increased the diaphragm movement from approximately 0.0005 to 0.001 inch.
  3. Improved pressure fitting installation procedure.
  4. EMI filtering to meet SS-1313-R, Rev. I requirements.
  5. Modification of sensing chamber to provide more space for possible contamination.
  6. Improved case sealing: silicone adhesive instead of a gasket.
- \* Purchased as an 837036-2, but updated to an 836706-2 configuration with exception of improved electronic package sealing.



6. Improved case sealing: silicone adhesive instead of a gasket.

These changes have been incorporated into transducer S/N 22323, except for the improved case seal. The improved transducer design has been reidentified by Part Number 836706-2. Two transducers (S/N 22321 and 22322) are presently being reworked to incorporate the change. In other words, all of the tests included in this report were done on the initial configuration except for the tests conducted on unit S/N 22323, which had been revised to the new configuration.

The transducer has a double "E" core/diaphragm type pressure sensing element. The "E" cores are hermetically sealed under inconel covers. The case halves are made from passivated 416 type stainless steel, and the sensing diaphragm is made from 410 type stainless steel. To obtain a high degree of dimensional stability, the diaphragm is prestretched. This operation allows the diaphragm to be subjected to a considerable overpressure without calibration shift.

#### TEST DESCRIPTIONS

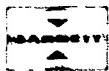
Five transducers were evaluated during this program. For clarity of presentation, the development tests and activities will be discussed separately for each transducer and not in the sequence in which the tests were done. Table 1 presents a summary of the tests completed to date on each test specimen. As shown on Table 1, a major portion of the test program has been completed on this unit. At the present time, the test program is continuing and the S/N 22323 is currently undergoing a water test. Future tests scheduled include further steam endurance testing where the transducer is operated while mounted on a steam generator, a corrosive contaminant oxygen-humidity test, and final disassembly inspection of the transducers.

#### Transducer 837036-2, S/N 22319 Testing

The S/N 22319 transducer was received from Pace-Wiancko and subjected to an initial calibration test. The results of this test and the results of the calibration test conducted by Pace-Wiancko are presented on Figure 1. The calibrations were quite similar and well within the  $\pm 200$  mv acceptable limit.

#### 1. Pressure Cycling

Following the initial calibration test the transducer was subjected to 20,000 working pressure cycles between 0.05 and 0.30 psia. Calibration checks were conducted at intervals during this test. The results of these intermediate calibration checks are presented on Figure 2. Although the transducer appears to be out of calibration at the 4,750 cycle calibration, test equipment error is suspected to have caused these high readings. A post calibration test showed that the transducer was within the allowable tolerances. The results of this test are presented on Figure 3.



A pressure test was conducted by subjecting the transducer to 500 pressure cycles between approximately 0 and 14.7 psia. Following this test the transducer remained within calibration limits as shown by Curve 1 of Figure 4.

## 2. Extreme Temperature Test

Following the pressure testing the transducer was tested for calibration at the extreme temperatures of 0, 150 and 200°F. Room temperature calibration checks were made after the 0 and 200°F extremes. The results of this testing are presented on Figure 4.

## 3. Water Test

The transducer was then subjected to a water test. The sensing cavity of the transducer was filled with tap water, drained and allowed to stand at room temperature for a five day period. Tap water was used for this test in order to simulate to some degree the contaminates that may be present in waste water. However, as found by later analysis, the contamination level of tap water is excessive.

Following the five day storage period, the transducer was subjected to a calibration test. The results of that test are presented on Figure 5. The transducer was found to exceed the 4 percent maximum allowable calibration shift below approximately .175 psia.

As a result of this out of tolerance operation, the transducer was disassembled and examined. The sensing chamber was found to contain brown deposits on the diaphragm as shown on Figure 6.

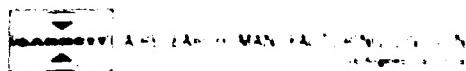
Chemical analysis showed that the contamination did not originate within the transducer. The contamination was apparently deposits caused by the tap water. It was concluded that the calibration shift was caused by the deposition of contaminates between the pole pieces and the diaphragm while stored at room pressure. As the pressure was decreased the deposition tended to inhibit movement of the diaphragm to the low pressure position. This resulted in a positive shift of the transducer calibration.

It should be pointed out that this test is felt to be too severe because of the excessive contamination contained in tap water. This test is presently being repeated with distilled water which provides more realistic conditions.

## Transducer 837036-2, S/N 22320 Testing

Following receipt of this transducer a calibration test was conducted to insure that the unit was within acceptable limits. The results of this test are presented on Figure 7.

The transducer was subjected to an ATP test per ATP SS-1759-R, ICM F. The data sheets from this test (Figure 8) show that the unit met the requirements and was acceptable.



### 1. Evaporator Steam Duct Test

The transducer was installed in the steam duct of an evaporator being used in a subsystem test. The transducer successfully sensed low-pressure steam pressure for a period of 282 hours. Intermediate calibration tests showed that the unit was functioning successfully (see Figure 9). Following the 282 hour exposure, the transducer was removed and subjected to a ATP test. The data sheets are presented on Figure 10.

### 2. Temperature Test per SS-1625-R

The transducer was installed into a test setup and subjected to the temperature profile as shown on Figure 11. No damage or degradation was observed as a result of this test. The post-test calibration data sheet is shown on Figure 12.

### 3. Vibration Test per SS-1560-R

The transducer was installed into a vibration fixture and supplied pressure of approximately 8 mm Hg A. Photographs of the setup in each axis are shown on Figure 13. The transducer was subjected to random vibration inputs simulating launch, flight and high G abort conditions. The inputs are presented on Figure 14. Data traces during vibration in the three axes are presented on Figure 15. The results of a post calibration test, conducted following vibration, are presented on Figure 16. The calibration showed that the transducer was within nominal requirements.

### 4. Shock Test per SS-1560-R

The transducer was subjected to a 78G shock test through the X+ axis. A photograph of the test setup is shown on Figure 17. The test was conducted at the Ogden Technology Laboratories, Inc., and their report is presented on Figure 18. A photograph of the shock calibration and impact shock trace is presented on Figure 19. A post test calibration check is presented on Figure 20. The transducer was within the required calibration limits.

### 5. Steam Endurance Test

A low pressure steam fixture was constructed to simulate the ECU evaporator steam environment in the pressure range between 5 and 10 mm Hg A. The fixture was capable of mounting up to eight transducers at one time, and could therefore expedite specimen exposures. The transducer was mounted on the fixture and was exposed to steam on a 24 hour a day basis. Performance was monitored on a continuous strip recording and was continuously within the nominal requirements. The transducers remained on the steam fixture in excess of 15 days, and a total of 360 hours were accumulated. Combining these hours with those accumulated on the previous evaporator steam test a total of 642 hours of life test cycles have been accumulated on this transducer.

## 6. Magnetic Field Effects

To determine the effect of a magnetic environment on the transducer operation, the transducer was mounted into a test setup and subjected to a magnetic field of 5 gauss. A calibration test was run at 0, 25, 50, 75, and 100 percent full scale, and at each level the magnetic field was changed from 0 to 5 to 0 gauss. A photograph of the test setup is shown on Figure 21. A data trace of this test is presented on Figure 22. The magnetic field resulted in no perceptible change in calibration at any level.

## 7. Attitude Test

An attitude test was performed to determine if the transducer is sensitive to any mounting attitude. The unit was pressurized to specific pressure levels within the calibration range. At each pressure level the transducer was calibration tested in both a + and - direction in the X, Y and Z axis. The results of this test are presented on Figure 23. No detrimental effects were observed and the unit was within calibration limits in all attitudes.

This transducer is presently awaiting further tests.

## Transducer 837036-2, S/N 22321 Testing

After receipt of this transducer an ATP test was conducted per SS-1759-R, ICN F. The results of this test are presented on Figure 24. The transducer was out of calibration at the lower pressures. The transducer was returned to the supplier and a transformer was replaced, however, the calibration was still out of tolerance. A decision was made to retain this unit at AiResearch for development of the EMI filters since testing with S/N 22322 had revealed that the transducer did not meet the RF conducted susceptibility requirements. Discussion of that test is presented later in this report. Later failure analysis was to show that the shift was caused by a magnetic leakage problem.

### 1. EMI Test per SS-1313-R, Rev. I

The transducers was modified with three separate EMI filter systems based on the findings from the EMI tests on transducer S/N 22322. The final fix was successful, and the test report from Genisco Technology Corporation is included in Appendix A of this report.

### 2. Modification

Following the successful completion of the EMI test the unit was returned to the supplier for failure investigation and modification. The failure report is presented on Figure 25. The failure report shows that a basic design modification was necessary to improve the transducer magnetic circuit design. The transducer is presently at the supplier being modified to the improved design and with other changes necessary to bring the transducer to the P/N 836706-2 configuration.



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DTD-191  
Page 6

10

### Transducer 837036-2, S/N 22322

Following receipt of this transducer from the supplier, a calibration check showed the transducer was acceptable. The calibration data is presented on Figure 26.

#### 1. Evaporator Steam Duct Test

Following the initial calibration test, the unit was installed in the steam duct used for system testing. A total of 167 hours were accumulated in this test setup. Following this test an ATP was completed and is presented on Figure 27.

#### 2. EMI Test Per SS-1313-R, Rev. 1

The transducer was sent to Genisco Technology Corporation for EMI testing. As mentioned previously, the EMI was found to exceed the RF conducted susceptibility requirements. The data sheet from that test is presented on Figure 28. As a result of this test a filter system was developed that corrected the problem. The complete EMI test on transducer S/N 22321 is presented in Appendix A.

#### 3. Steam Endurance Test

Following the EMI test the transducer was installed in the steam generator test fixture as previously described. The unit was functionally subjected to the steam environment for 216 hours or approximately 9 days. At this time the unit was removed from the steam fixture and subjected to an ATP checkout. The transducer exceeded the minimum allowable tolerance at all but the highest test pressure. The data sheets are presented on Figure 29. The unit was returned to the supplier and the sensing cavity was opened. No evidence of either corrosion or contamination was found. The transducer was given a detailed failure analysis.

#### 4. Modification

As shown on Figure 25 the calibration shift was caused by the magnetic path problem as previously discussed. The calibration shift of both this transducer and transducer S/N 22321 are attributed to the same cause. This transducer is presently being updated to the 836706-2 configuration that eliminates magnetic flux leakage as discussed in Figure 25.

### Transducer 836706-2, S/N 22323 Testing

This transducer configuration is revised to include the fixes determined to be necessary during the previous tests. The unit, however, did not incorporate a silicone adhesive for improved cover and electrical connector to case sealing. A gasket was used for this unit. The gasket is not considered to be a sufficient moisture barrier and the use of the silicone adhesive will ensure a positive seal.



AIRESEARCH MANUFACTURING DIVISION  
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DTD-191  
Page 7

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### 1. Extreme Temperature Test

Before the start of this test, to check the repeatability of the transducer, two calibrations were made 24 hours apart. As shown on Figure 30 the two calibrations were very close. Three of the calibration points on the second calibration check were made following a proof pressure of 22.5 psia. This test illustrates the high pressure margin and the excellent stability of this transducer.

The transducer was then subjected to temperature extremes at 0, 150, and 200°F with intermediate room temperature calibration checks. These results are also shown on Figure 30. The calibration was well within the nominal range for all these tests.

### 2. Pressure Cycling Test

Following the temperature cycling test, the transducer was subjected to 20,000 working pressure cycles and 500 ambient range pressure cycles. Working pressure cycles were between 0.05 and 0.30 psia and ambient range cycles were between 0 and 14.7 psia. The results of the calibration check following this test were well within the acceptable limits (in a band of  $\pm 1.5\%$ ) and are shown on Figure 30.

### 3. Steam Endurance Test

The transducer was installed in the continuous steam generator and functionally subjected to 360 hours or over 15 days exposure. Following this exposure the unit was subjected to a post-test ATP calibration check. The data sheets, Figure 31 show the unit was within the nominal tolerances.

### 4. Water Test

The water soak test is presently in progress on this transducer. At this time the transducer has completed three out of four of the projected water soak cycles.

For this test, the transducer sense chamber is vacuum filled with distilled water and allowed to stand for approximately 48 hours. The water is then removed by heating to 150°F in a vacuum. The transducer is then checked for calibration shift.

Four water soak cycles as described above, are planned for this test. Three cycles are complete and the results are presented in the following figures:

<u>Figure</u>	<u>Calibration</u>
32	After first soak
33	After second soak
34	After third soak

The transducer is presently in its fourth and last cycle. As shown by the data sheets, the calibration has remained within acceptable limits.



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DTD-191  
Page 8

12

## CONCLUSIONS AND RECOMMENDATIONS

Based on the encouraging results of the testing completed to date, AiResearch has decided to submit an EDCP for the incorporation of the P/N 836706-2 Pace-Wiancko transducer in the Item 8.17 steam duct pressure application. At this time the transducer has proved its ability to retain a calibration within the required tolerance range.

The problems experienced with unit Serial Numbers 22321 and 22322 have apparently been successfully resolved by the changes incorporated for the 836706-2 configuration. The transducer, revised to that configuration, has been shown to remain stable and well within the required tolerance range.

The water soak tests, conducted on the new configuration, have not shown any indication of the extreme calibration drift that was experienced on the S/N 22319 transducer. This further supports the conclusion that the impurities contained in the tap water were a contributing cause of that calibration change.

The upward shift of the transducer output experienced on S/N 22321 and 22322 was attributed to an undesirable feature of the transducer magnetic circuit. The revised configuration, S/N 22323 incorporates an inconel ring around the "E" core which provides a high reluctance path between the "E" core and the magnetically permeable stainless steel case half. In the previous design, magnetic leakage through the case half formed a part of the path through the diaphragm and back to the "E" core. This leakage path plus minute shifts within the "E" core assembly were the cause of the calibration shifts. The inconel ring used in the new design provides a high reluctance path that attenuates case half leakage and reduces the transducer sensitivity to these minute shifts within the "E" core assembly. The sensor output is increased by an appreciable factor because of the resulting magnetic field concentration. The output was further increased by increasing the diaphragm movement from 0.0005 to 0.001 inch.

This approach has been used as a fix for a similar instability problem experienced on a ΔP transducer for the Grumman LEM application. According to Pace-Wiancko that unit has been successfully qualified.

The transducer initially had an EMI problem having exceeded required limits in the radio frequency conducted susceptibility test. This problem was resolved by inclusion of an improved EMI filter system.

To further prove the integrity of the 836706-2 configuration, the development tests are continuing and will include further functional steam testing, corrosive contaminant oxygen-humidity testing, and disassembly inspection of the units following the test program.

TABLE I  
PACE-WIANCKO TRANSDUCER  
DEVELOPMENT TEST HISTORY

Inclusive Test Dates	Test	Remarks	Applicable Figure No.
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Part Number 837036-2, S/N 22319

1 to 30 Aug 1967	Initial Calibration Test	Passed	1
	Pressure Cycling Test	20,000 working pressure cycles, calibration test, and 500 ambient range cycles: Passed	2, 3, and 4
	Extreme Temperature Test	Calibration at 0, 150, and 200°F: Passed	4
	Water Test	Filled sense cavity with tap water and soaked for 5 days	-
	Calibration Test	Out of allowable calibration tolerance	5
	Disassembly	Contamination found in sensing chamber--unit scrapped	

Part Number 837036-2, S/N 22320

10 Sept. 1967 to 3 Jan 1968	Initial Calibration Test	Passed	7
	ATP per SS-1759-R, ICN-F	Passed	8
	Evaporator Steam Duct Test	Ran a total of 282 hours under system test conditions. Passed two intermediate calibration tests	9
	ATP per SS-1759-R, ICN-F	Passed	10
	Temperature Test per SS-1625-R	Passed this test and post-test calibration check	11, 12
	Vibration Test per SS-1625-R	Vibration in 3 axes at launch flight and high Q abort	15
	Calibration Test	Passed	16
	Shock Test per SS-1560-R	78G shock in the X axis	19



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Table I (Page 1 of 3)  
DTD-191  
Page 10

14

TABLE I (Continued)

Inclusive Test Dates	Test	Remarks	Applicable Figure No.
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Part Number 837036-2, S/N 22320 (Continued)

	Calibration Test	Passed	20
	Steam Endurance Test	Ran a total of 360 hours on a steam generator. Unit operated within tolerance requirements	-
	Magnetic Field Effects Test	Exposed to a 0 to 5 gauss magnetic field to determine the effect on calibration. Passed with no perceptible effect	22
	Attitude	Determined the effect of attitude on calibration. Operation was within tolerance limits	23

Part Number 837036-2, S/N 22321

28 Oct 1967 to present	ATP per SS-1759-R, ICN-F	Out of calibration tolerance limit. Returned to supplier. Unit not repaired--Returned to AiResearch for EMI tests	24
	EMI Test per SS-1313-R, Revision 1	Transducer used to develop EMI filter system. Passed subsequent EMI test following modification	Appendix A
	Modification	Returned to supplier for failure analysis and modification to 836706-2 configuration	25

Part Number 837036-2, S/N 22322

4 Oct 1967 to present	Evaporator Steam Duct Test	Ran a total of 167 hours under system test conditions	-
	ATP per SS-1759-R, ICN-F	Passed	27
	EMI Test per SS-1313-R, Revision 1	Did not pass RF conducted test. The required filtering was developed using S/N 22321	28

AIResearch MANUFACTURING DIVISION  
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DTD-191  
Page 11

15

TABLE I (Continued)

Inclusive Test Dates	Test	Remarks	Applicable Figure No.
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Part Number 837036-2, S/N 22322 (Continued)

	Steam Endurance Test	Ran a total of 216 hours on a steam generator. Unit was out of calibration on a subsequent ATP test.	29
	Modification	Returned transducer to supplier--opened chamber no contamination or corrosion noticed. Failure analysis conducted and unit is now being modified to 836706-2 configuration.	25

Part Number 836706-2\*, S/N 22323

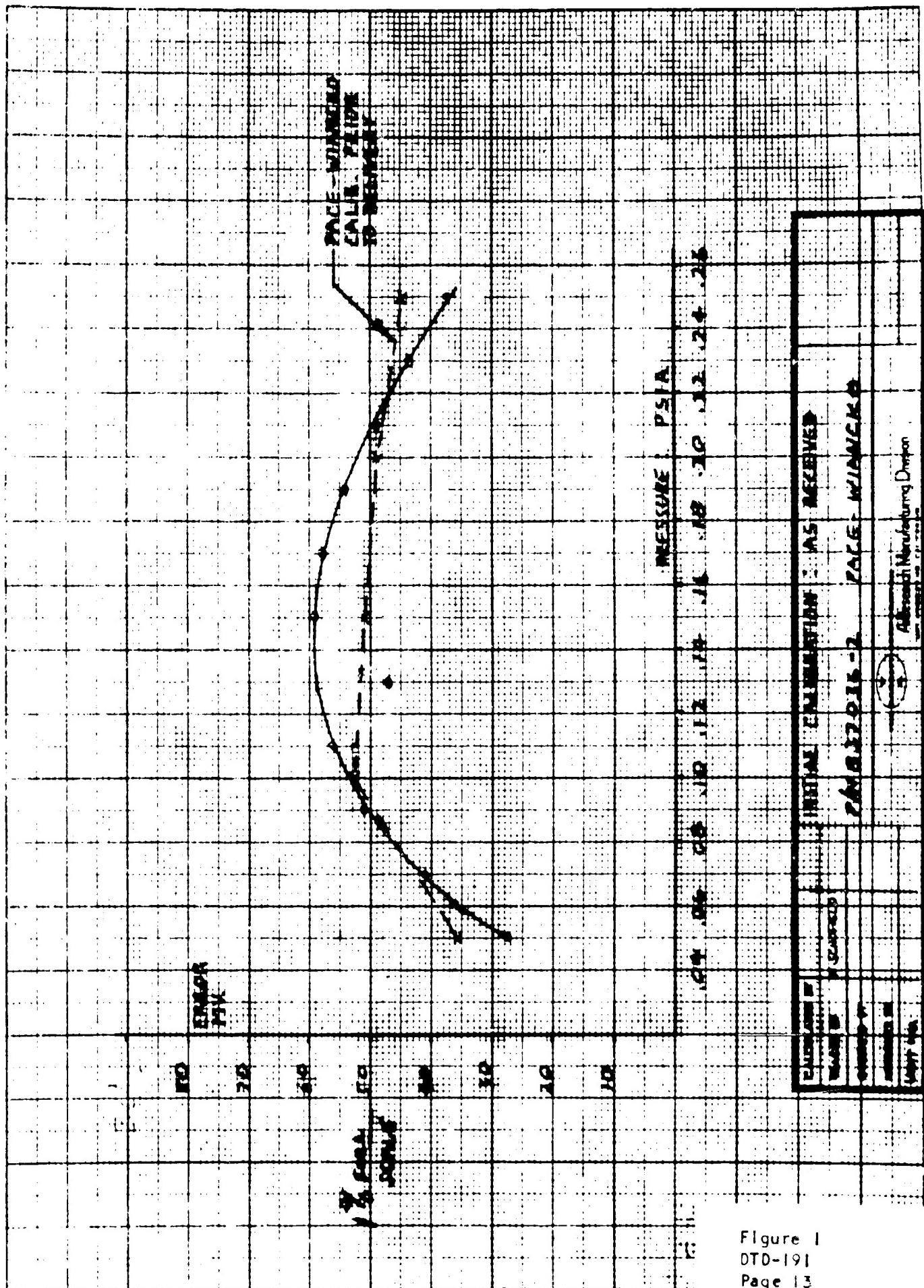
16 Nov 1967 to present	Initial Calibration	Passed	30
	Extreme Temperature Test	Passed	30
	Pressure Cycling Test	20,000 working cycles and 500 ambient range cycles	30
	Steam Endurance Test	Ran a total of 360 hours on a steam generator. Unit was within tolerance on a subsequent ATP	31
	Water Test	Filled sensing cavity with 32, 33, distilled water. Presently and 34 in fourth water soak	

\* This transducer did not incorporate the silicone adhesive case sealing of this configuration, otherwise it is identical.

AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

Table I (Page 3 of 3)  
DTD-191  
Page 12

16



**DEVELOPMENT TEST  
DATA SHEET**

P/N 837036-2 S/N 22319

PRESSURE CYCLE TEST

PRESSURE RANGE .05 - .30 PSIA

CYCLES IN THOUSANDS	PRESSURE		OUTPUT - VOLTS			DATE
	PSIA	INS. HG. A	NOMINAL	READ	ERROR MV	
4,750	.05	.10180	0	.092	+ 92	8-4-67
	.15	.30541	2.5	2.588	+ 188	
	.25	.50903	5.0	5.218	+ 218	
6,000	.05	.10180	0	.048	+ 48	8-4-67
	.15	.30541	2.5	2.608	+ 108	
	.25	.50903	5.0	5.073	+ 73	
7,002	.05	.10180	0	0.055	+ 55	8-5-67
	.15	.30541	2.5	2.586	+ 86	
	.25	.50903	5.0	5.048	+ 48	
8,000	.05	.10180	0	0.058	+ 58	8-5-67
	.15	.30541	2.5	2.588	+ 88	
	.25	.50903	5.0	5.050	+ 50	
10,000	.05	.10180	0	.059	+ 59	8-5-67
	.15	.30541	2.5	2.590	+ 90	
	.25	.50903	5.0	5.049	+ 49	
15,145	.05	.10180	0	0.0558	+ 55.8	8-7-67
	.15	.30541	2.5	2.577	+ 77	
	.25	.50903	5.0	5.028	+ 28	
20,000	.05	.10180	0	0.047	+ 47	8-8-67
	.15	.30541	2.5	2.572	+ 72	
	.25	.50903	5.0	5.029	+ 29	

CALIBRATED BY: NORM SCHOFIELD



AMERICAN MANUFACTURING CO.

Figure 2  
DTD-191  
Page 14

DEVELOPMENT TEST  
DATA SHEET

P/N 837036-2 S/N 22319  
(MFD BY PACE-WIANCKO)

ACCURACY TEST

AFTER 20,000 SMALL RANGE CYCLES  
BEFORE 500 PROOF PRESS. CYCLES

PSIA	in. Hg A	OUTPUT - VOLTS		
		NOMINAL	INC.	INC. ERROR
.05	.10180	0	0.039	+ 39
.07	.14253	0.50		
.09	.18325	1.0	1.055	+ 55
.11	.22397	1.5		
.13	.26469	2.0	2.057	+ 57
.15	.30541	2.5		
.17	.34614	3.0	3.062	+ 62
.19	.38686	3.5		
.21	.42758	4.0	4.045	+ 45
.23	.46830	4.5		
.25	.50903	5.0	5.022	+ 22

CALIBRATED BY: KEN WILKEN

AMERICAN METER COMPANY  
1000 West 7th Street  
Los Angeles, California 90007

Figure 3  
STD-191  
Page 15

19

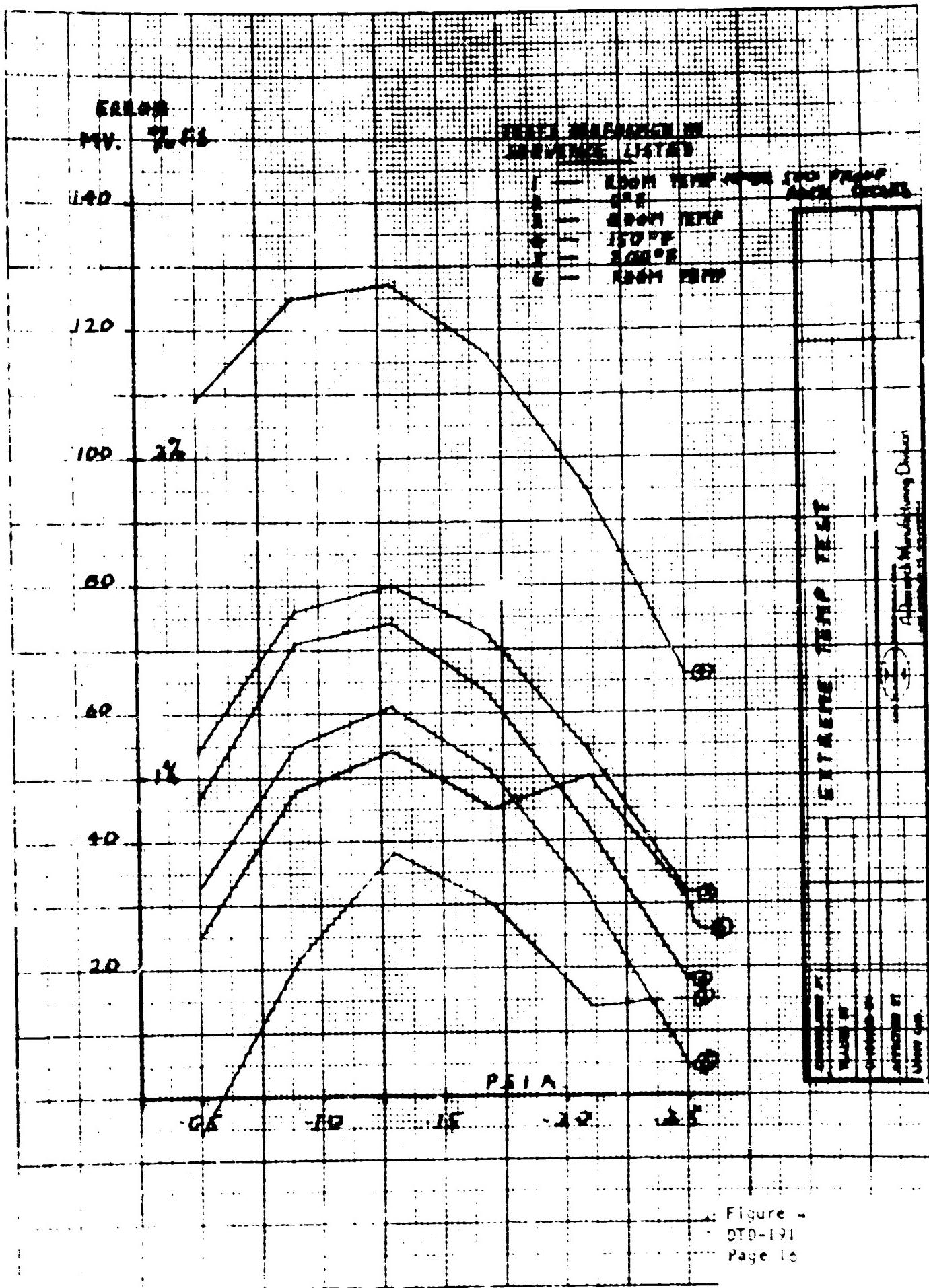
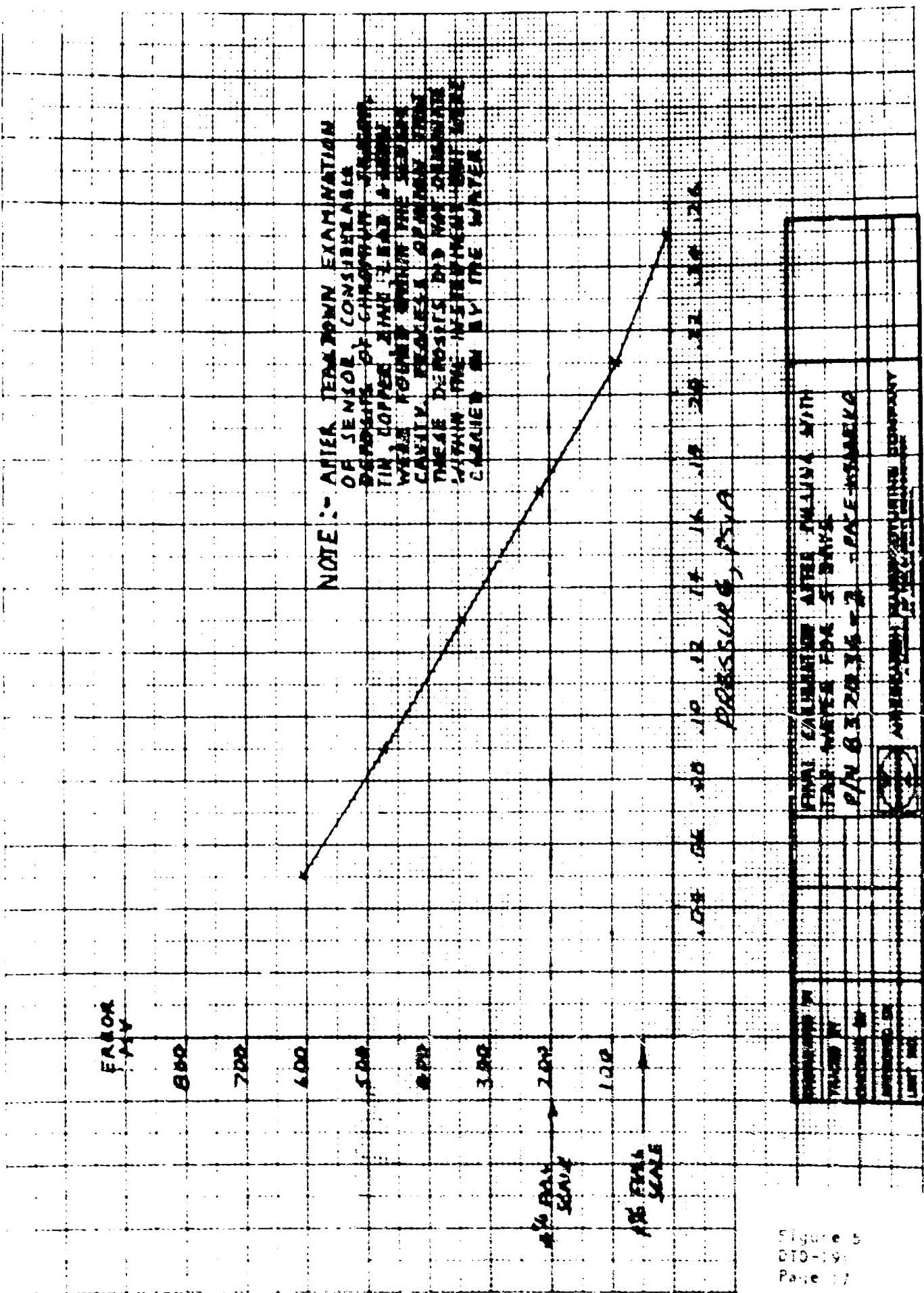


Figure -  
STD-191  
Page 16



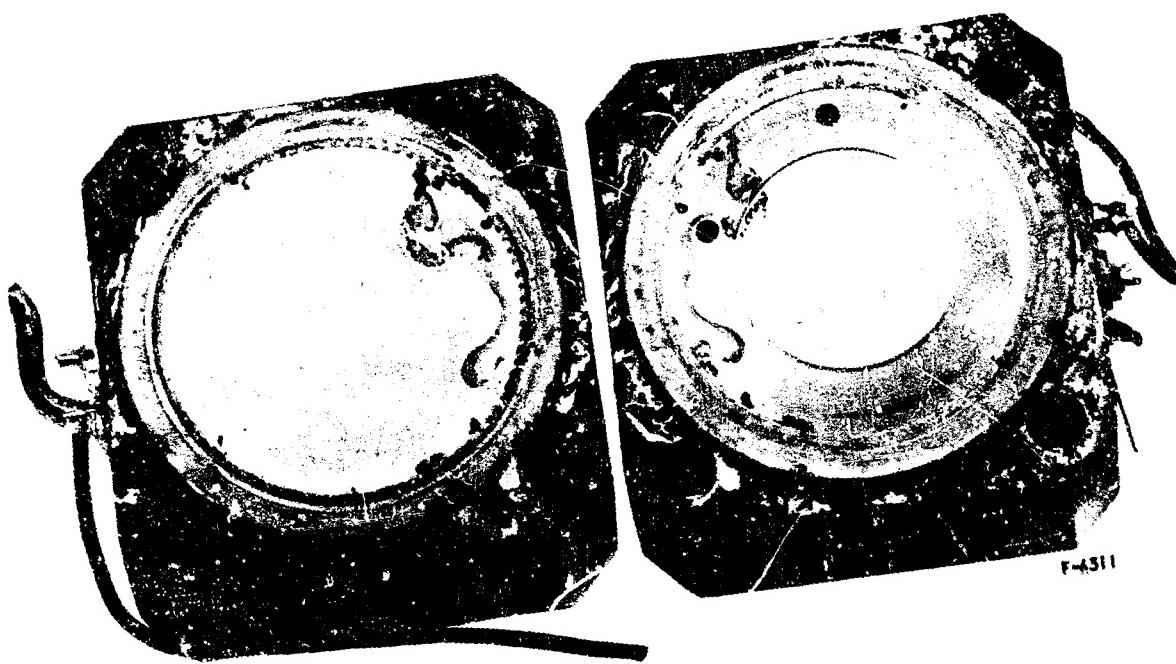


Figure 6. Transducer Disassembly Showing  
Deposits: P/N 837036-2, S/N 22319

DTD-191  
Page 18



AIRSEARCH MANUFACTURING DIVISION  
Los Angeles, California

DATE: 10 Sept 67

DEVELOPMENT TEST  
DATA SHEET

P/N 837036-2 S/N 22320  
(MFD BY PACE-WIANCKO)

INITIAL ACCURACY TEST

MM Hg.	PSIA	INS. Hg. A	OUTPUT - VOLTS		
			NOMINAL	ACTUAL	ERROR, mv
2.58	.05	.10180	0	+ .032	+ .32
3.62	.07	.14253	0.50	.543	+ .43
4.65	.09	.18325	1.0	1.049	+ .49
5.69	.11	.22397	1.5	1.553	+ .53
6.72	.13	.26469	2.0	2.056	+ .56
7.75	.15	.30541	2.5	2.557	+ .57
8.79	.17	.34614	3.0	3.058	+ .58
9.82	.19	.38686	3.5	3.557	+ .57
10.86	.21	.42758	4.0	4.056	+ .56
11.89	.23	.46830	4.5	4.555	+ .55
12.92	.25	.50903	5.0	5.053	+ .53

CALIBRATED BY: N. SCHOFIELD



AIRESEARCH MANUFACTURING DIVISION

DTD-191

Page 19

23

SS-1759-R  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

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STEAM DUCT PRESSURE TRANSDUCER 837036-2

NAA REF. SPEC. ME 1 NASA

Part Number 837036-2 S/N 22320

Date 9-13-67 Barometer 29.8 in. Hg abs Amb Temp 75 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept Reject

Remarks: ECU 0 - 3404-200(17-67-2153)

Dimensional Check Verified: 3.67

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 3.213 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+28.0 ± 0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ± 0.2000	+0.0740
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ± 0.2000	+1.2601
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ± 0.2000	+2.601
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ± 0.2000	+3.8530
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ± 0.2000	+5.1010
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ± 0.2000	+3.8521
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ± 0.2000	+2.6000
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ± 0.2000	+1.3362
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ± 0.2000	+0.0632

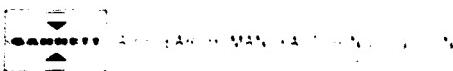


Figure 8 (page 1 of 5)

DTD-191

Page 20

24

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
2 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837086-2

P/N 837086-2  
S/N 22320

NAA REF. SPEC. ME

NASA

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept 32/13 Reject 4-13-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept 32/13 Reject 4-13-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: Accept 32/13 Reject 4-13-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	+30.0
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	0.0
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	0.0

Maximum Output Voltage Test: Accept 32/13 Reject 4-13-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	+6.27



AND CARRY MANUFACTURING CO., INC.  
Division of Gardner Denver Inc.

Figure 8 page 2 of 5)

DTD-191

Page 21

25

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
3 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-2

P/N 837036-2  
S/N 22220

NAA REF. SPEC. ME

NASA

Input Current Test:

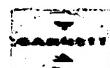
4-13-67  
Accept 32113 Reject           

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SW1 at pos 1)	ma	40 max	20
Input current (SW1 at pos 2)	ma	40 max	20

Calibration Test:

4-13-67  
Accept 32113 Reject           

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 to 2.000	+0.0682
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3410
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.6030
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.8570
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+5.1060
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.8626
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.6066
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3420
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0626



AIR FORCE - MANUFACTURING COMPANY  
A Division of Allis-Chalmers

Figure 8 (page 3 of 5)  
DTD-191  
Page 22

Interim Change Notice Letter: F  
 ATP No.: SS-1759-R  
 Effective Date: 22 May 1967

SS-1759-R  
 Data Sheet  
 4 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
 STEAM DUCT PRESSURE TRANSDUCER 837036-2

P/N 837036-2  
 S/N 22320

NAA REF. SPEC. ME

NASA

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 ±0.2000	+1.3450
11f	Pressure (PS2)	In. Hg abs	1.0 ±0.5	1.0
11g	Output voltage	vdc	+1.2500 ±0.2000	+1.3430
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 ±0.2000	+1.3410
	(3) Pressure PS2	In. Hg abs	1.0 ±0.5	1.0
	(4) Time at test	hours	3	3

9-13 G 7

Input Voltage Variation Test:

Accept 32113 Reject \_\_\_\_\_

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586	2.586	+25.0 ±0.1	+25.0	0.0000 ±0.2000	+0.0580
	2.586	+30.0 ±0.1	+30.0	0.0000 ±0.2000	+0.0580
12.929	12.929	+25.0 ±0.1	+25.0	+5.0000 ±0.2000	+5.073
	12.929	+30.0 ±0.1	+30.0	+5.0000 ±0.2000	+5.072

9-13 G 7

Output Ripple Test:

Accept 32113 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	1.8

9-13 G 7

Isolation Resistance Test:

Accept 32113 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	100 min	5.8 X 10 <sup>5</sup>

Figure 8 (page 4 of 5)

DTD-191

Page 23

21

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
5 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2  
STEAM DUCT PRESSURE TRANSDUCER 837036-2 S/N 22328

NAA REF. SPEC. ME NASA 9-13-67

Insulation Resistance Test: Accept 32113 Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	Vdc	100	100
Resistance	megohms	50 min	$1 \times 10^5$

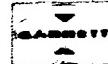
Weight:        lb.

Remarks:       

Test Specimen Status: Accept        Reject       

By       

Inspection:        AIResearch Q.C.        NAA Q.C.        DCAS-QAR



AIR RESEARCH MANUFACTURING COMPANY INC.  
A Division of AiResearch Manufacturing Company Inc.

Figure 8 (page 5 of 5)

DTD-191

Page 24

DEVELOPMENT TEST  
DATA SHEET

P/N 837036-2      S/N 22320  
(MFD BY PACE-WIANCKO)

OUTPUT - VOLTS					
PSIA	INS.Hg.A	NOMINAL	INITIAL ACCURACY AS RECEIVED 9-10-67	65 HOURS SYSTEM TEST INC. 5 START-RUN AND SHUT-DOWN CYCLES 9-25-67	174 HOURS TOTAL SYSTEM TEST INC. 15 START-RUN AND SHUT-DOWN CYCLES 10-11-67
.05	.10180	0	+ .032	+ .038	+ .048
.07	.14253	0.50	.543		
.09	.18325	1.0	1.049	1.055	1.060
.11	.22397	1.5	1.553		
.13	.26469	2.0	2.056	2.056	2.056
.15	.30541	2.5	2.557		
.17	.34614	3.0	3.058	3.051	3.064
.19	.38686	3.5	3.557		
.21	.42758	4.0	4.056	4.044	4.054
.23	.46830	4.5	4.555		
.25	.50903	5.0	5.053	5.034	5.036

CALIBRATED BY: N. SCHOFIELD

MANUFACTURED BY  
GARRETT AEROSPACE MANUFACTURING COMPANY  
2000 G STREET, WASHINGTON, D.C. 20006

Figure 9  
DTD-191  
Page 25

27

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
1 of 3

ACCEPTANCE TEST  
DATA SHEET

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STEAM DUCT PRESSURE TRANSDUCER 837036-2 Z-1

NAA REF. SPEC. ME NASA 0040000 22320

Part Number 837036-2-1 S/N 22320

Date 10-28-67 Barometer 29.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept \_\_\_\_\_ Reject \_\_\_\_\_

Remarks: EWD 3404-200117-69-2154

Dimensional Check Verified: 10-28-67

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 32<sup>11</sup>/<sub>3</sub> Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0160
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2520
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4750
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6880
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8890
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6880
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4720
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.254
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0130

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
2 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22320

NAA REF. SPEC. ME

NASA 004000022320

10-28-67

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept 32113 Reject           

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

10-28-67

External Leakage Test (Nitrogen Gas Test Fluid): Accept 32113 Reject           

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

10-28-67

Diode Test:

Accept 32113 Reject           

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	+30.0
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	0.0
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	0.0

10-28-67

Maximum Output Voltage Test:

Accept 32113 Reject           

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	6.26

Figure 10 (page 2 of 5)  
DTD-191  
Page 27

31

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
3 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22320

NAA REF. SPEC. ME

NASA 004000022320

10-28-67

Accept 32113 Reject  

Input Current Test:

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SWL at pos 1)	ma	40 max	19
Input current (SWL at pos 2)	ma	40 max	19

Calibration Test:

Accept 34113 Reject  

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0270
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2600
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4800
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6900
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8900
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6900
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4800
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2550
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0170

STANAG 1020 FORM 100-1

DTG-1-1

Page 20

22

SS-1759-R  
 Date Sheet  
 4 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
 STEAM DUCT PRESSURE TRANSDUCER 837030-52-1 S/N 22320

NAA REF. SPEC. ME

NASA 004000022320

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 ±0.2000	+1.2350
11f	Pressure (PS2)	In. Hg abs	1.0 ±0.5	1.0
11g	Output voltage	vdc	+1.2500 ±0.2000	+1.2370
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 ±0.2000	+1.2278
	(3) Pressure PS2	In. Hg abs	1.0 ±0.5	0.85
	(4) Time at test	hours	3	3

Input Voltage Variation Test:

Accept \_\_\_\_\_ Reject \_\_\_\_\_

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.580	2.586	+25.0 ±0.1	25.0	0.0000 ±0.2000	+0.0049
	2.586	+30.0 ±0.1	30.0	0.0500 ±0.2000	+0.0250
12.929	12.924	+25.0 ±0.1	25.0	+5.0000 ±0.2000	+4.8507
	12.924	+30.0 ±0.1	30.0	+5.0000 ±0.2000	+4.8515

Output Ripple Test:

Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	1.7

Isolation Resistance Test:

Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	110
Resistance	megohm	100 min	110

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
5 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
STEAM DUCT PRESSURE TRANSDUCER 837036-32-1 S/N 22320

NAA REF. SPEC. ME NASA 004000022320

Insulation Resistance Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	9 x 10 <sup>4</sup>

Weight: \_\_\_\_\_ lb.

Remarks: \_\_\_\_\_  
\_\_\_\_\_

Test Specimen Status: Accept \_\_\_\_\_ Reject \_\_\_\_\_

By \_\_\_\_\_

Inspection: AIRSEARCH Q.C. NAA Q.C. DCAS-QAR



AIRSEARCH MANUFACTURING DIVISION  
Los Angeles, California

Figure 10 (Page 5 of 5)  
DTD-191  
Page 30

31

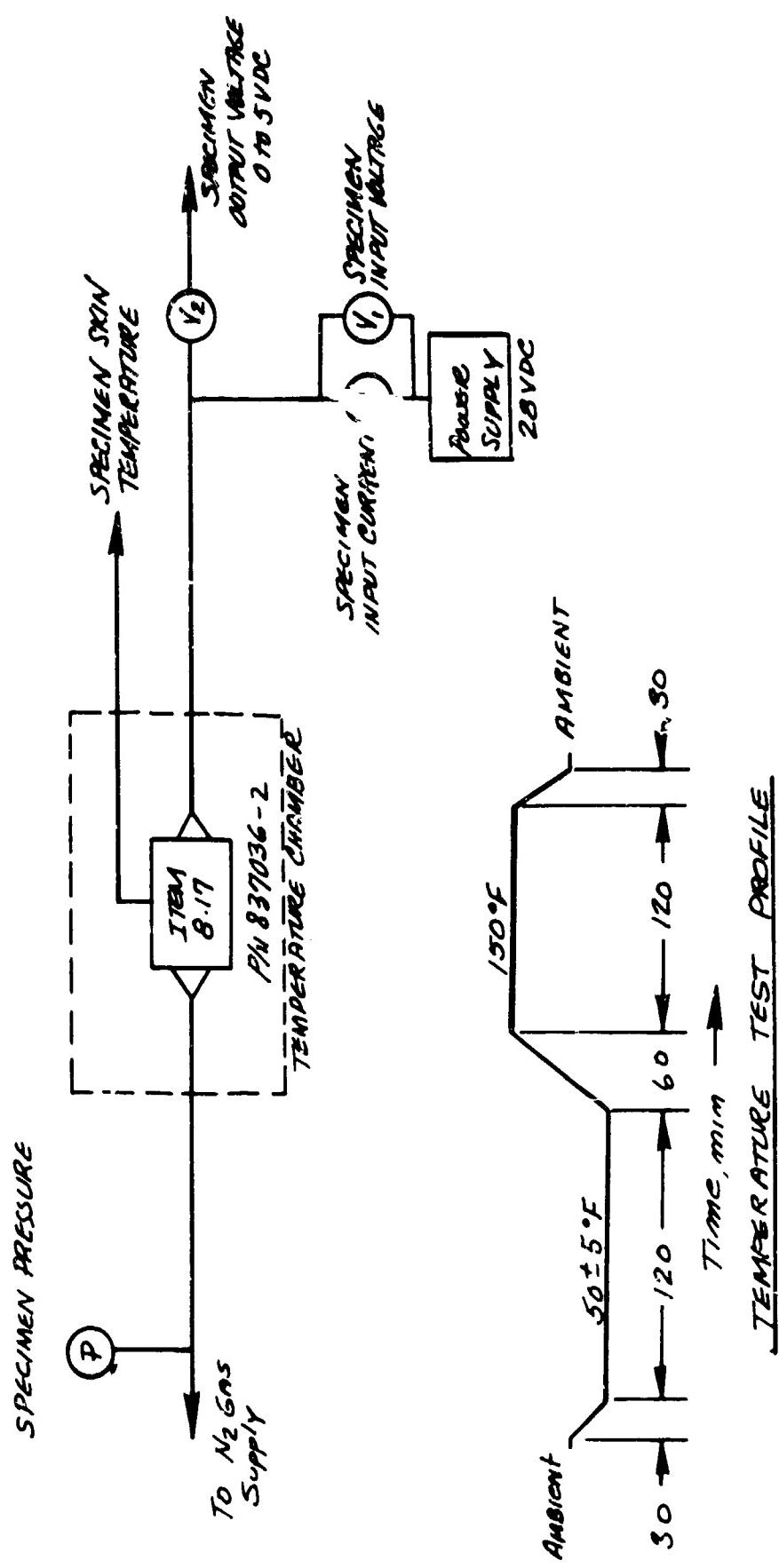


Figure 11. Temperature Test Setup



Interim Change Notice Letter: F  
ATP No.: 88-1789-A  
Effective Date: 22 March 1967.

88-1789-A  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 887036-2 - 2 - 1

NAA REC. SPEC. NR NASA

Part Number 887036-2-1 S/N 22330

Date 11-2-67 Barometer 29.9 in. Hg abs Amb Temp 24 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept \_\_\_\_\_ Reject \_\_\_\_\_

Remarks: \_\_\_\_\_

Dimensional Check Verified: 11-2-67

Perf. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 3213 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+28.0 ±0.3	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0120
Specimen pressure	mm Hg abs	3.171	3.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2240
Specimen pressure	mm Hg abs	7.737	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4500
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6690
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8860
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6670
Specimen pressure	mm Hg abs	7.737	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	2.4450
Specimen pressure	mm Hg abs	8.171	8.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2230
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0150

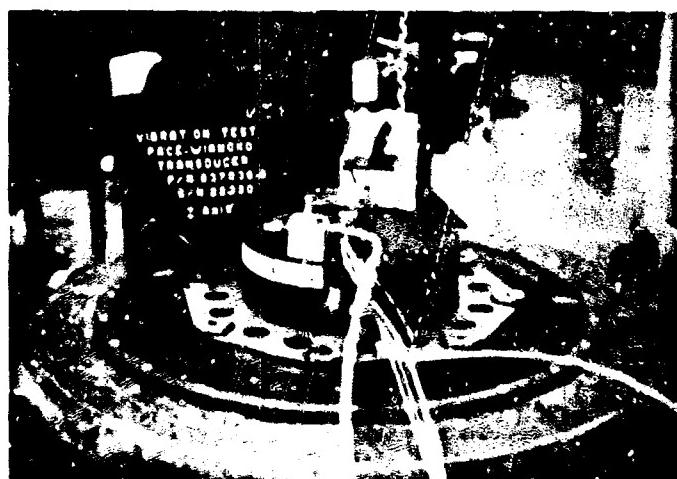


ARLSEARCH MANUFACTURING DIVISION

Figure 12

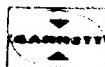
DTD-191

Page 32



F-8621

Figure 13. Vibration Test Setup  
P/N 837036-2, S/N 22320



AERSEARCH MANUFACTURING DIVISION  
1974-1984 EDITION

070-191  
Page 33

37

**VIBRATION TEST RANDOM SPECTRUM  
80 FILTER ANALYSIS  
ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL**

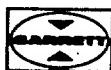
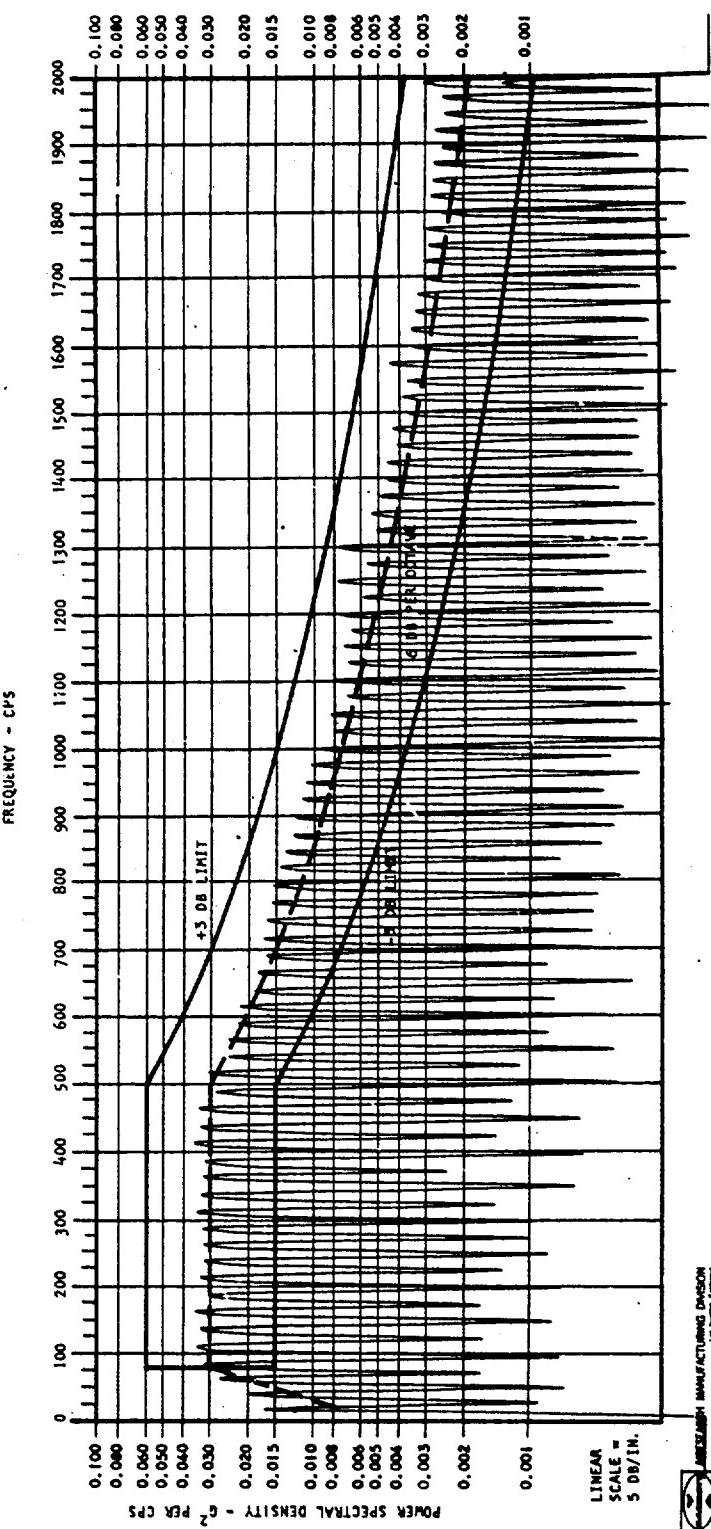
**ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL**

DATE Nov-2-1967 START TIME 7:00 OF 2

**PART NAME** Re: Minimco Transducer **P/N** 837046-2 **S/N** 22350 **ENG NO.** 5104-200/17-602-232 **PROCEDURE NO.** 55T-1622-E **PARAGRAPH NO.** E4 **Fixture No.** T-602637 **VIBRATION SYST. NO.** 1 **CONTROL ACCEL ENDFC M/N** 2235 **ENDFC-72** **MATERIAL CONDITIONS:** **PRESS.** 20.85% **TEMP.** 77° REL. HUMID. 65% **TEST AXIS** Y **TOTAL MINUTES REQUIRED** 2.5 **ACTUAL 2.5** **INPUT G R.M.S.** **REQUIRED** 5.0 **ACTUAL 5.0** **FILTER BAND WIDTH** 25 CPS **FIRST FILTER CENTER FREQ.** 25 CPS **VIBRATION TECHNICIAN** T.WALKLEY **AIRSEARCH QC** NAA **DCAS-QAR** **REMARKS** **APOLLO TEST ENGINEER** J.H. D.G.C.

**CROSTAL:** AXIS G R.M.S. **AXIS** G R.M.S. **SPECIMEN:** G R.M.S.

QMS 2105



**AIRESEARCH MANUFACTURING DIVISION**  
Los Angeles, California

Figure 14 (Page 1 of 9)  
DTD-191  
Page 34

38

# VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE I-C/M SPACE FLIGHT LEVEL

**ZONE I-C/M SPACE FLIGHT LEVEL**

SHEET 2 OF 2

DATE MAY-8-1962 START TIME \_\_\_\_\_

PARAGRAPH NO. 54

PROCEDURE NO. SS-1645-A

TEST AXIS NO. 1 CONTROL ACCEL ENVELOPE H/M/N 2225 SINUSOIDAL AMBIENT CONDITIONS: PRESS. 220 PSF/IN. TEMP. 77° F. REL. HUMID. 62%

TEST AXIS NO. 1 TOTAL MINUTES: REQUIRED 12.5 ACTUAL 12.5 INPUT G RMS: REQUIRED 2.4 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS

APOLLO TEST ENGINEER L.H. LADIGE VIBRATION TECHNICIAN T.MAKALEY

AIRESEARCH QC NAA DCAS-QAR

CROSSTALK: \_\_\_\_\_ AXIS: \_\_\_\_\_ G RMS: \_\_\_\_\_ SPECIMEN: \_\_\_\_\_ G RMS: \_\_\_\_\_

REMARKS: \_\_\_\_\_

FREQUENCY - CPS

PROCEDURE SPECTRAL DENSITY -  $G^2$  PER CPS

AIRESEARCH MANUFACTURING DIVISION  
San Bruno, California



**AIRESEARCH MANUFACTURING DIVISION**  
Los Angeles, California

**Figure 14 (Page 2 of 9)**  
**DTD-191**  
**Page 35**



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

VIBRATION TEST RANDOM SPECTRUM  
80 FILTER ANALYSIS  
ZONE I-C/M HI-Q ABORT LEVEL

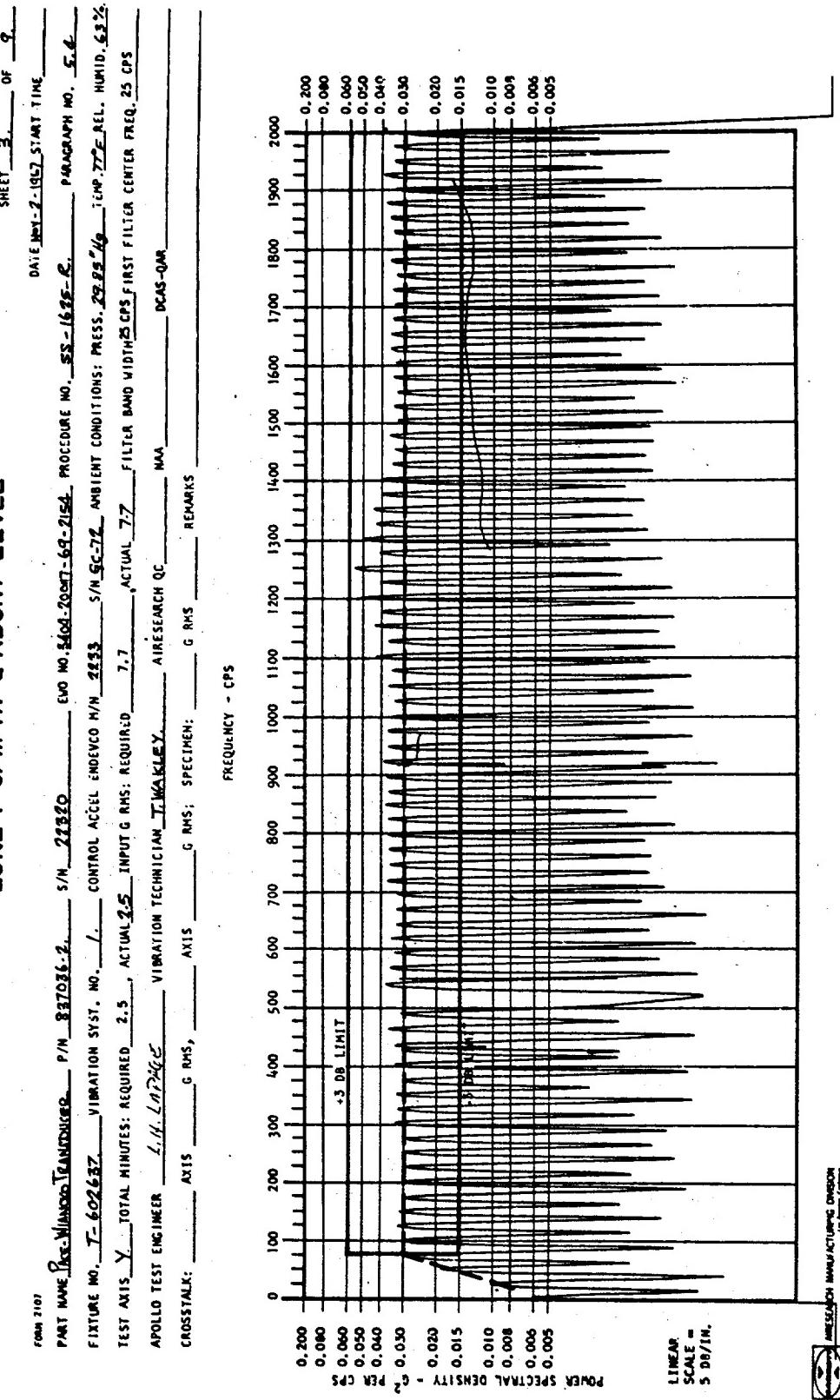
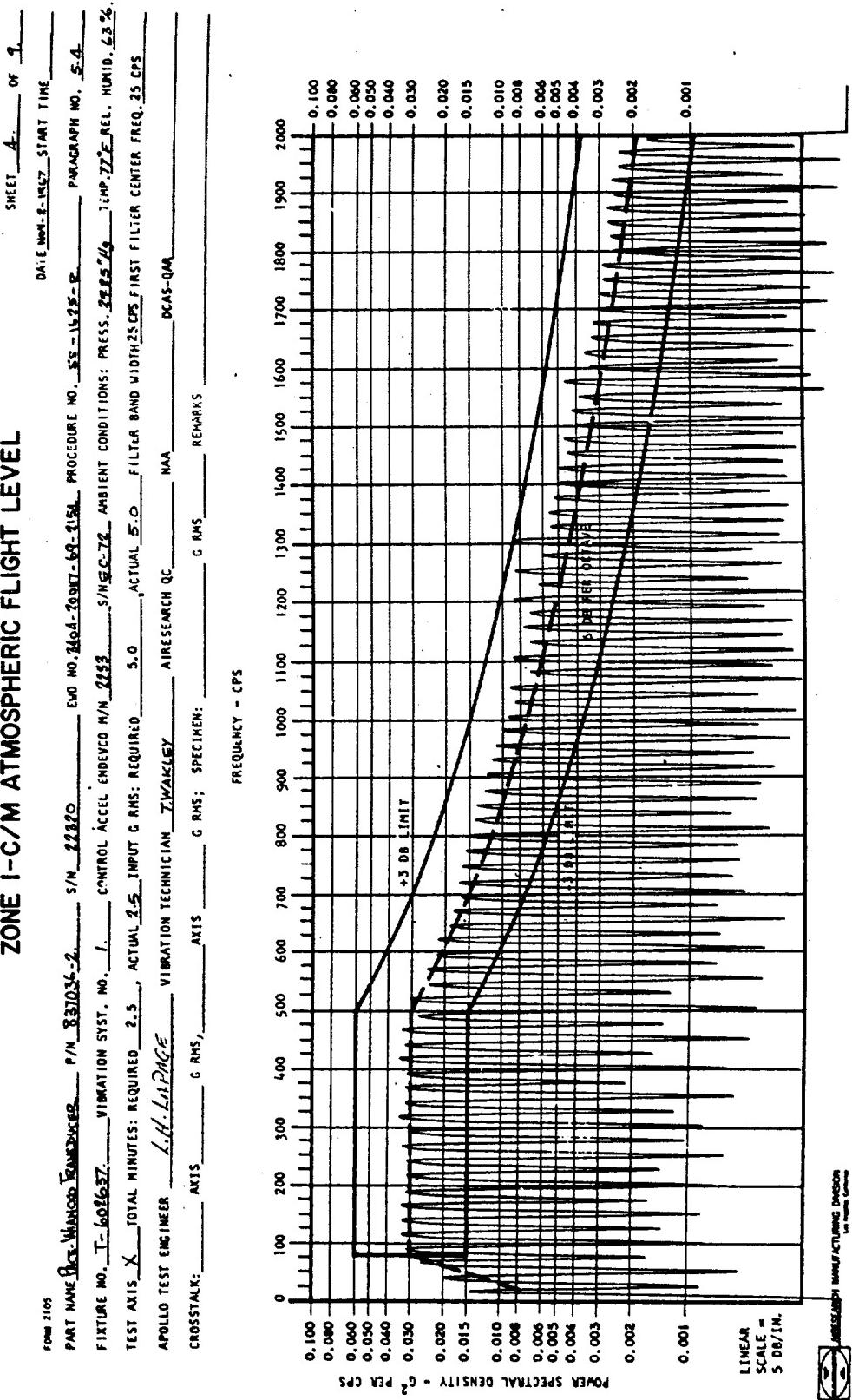


Figure 14 (Page 3 of 9)  
DTD-191  
Page 36

Figure 14. Y Axis Vibration Spectrum-High Q Abort

**VIBRATION TEST RANDOM SPECTRUM**  
**80 FILTER ANALYSIS**  
**ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL**



AIRESEARCH MANUFACTURING DIVISION  
 Los Angeles, California

Figure 14 (Page 4 of 9)  
 DTD-191  
 Page 37

Figure 14. X Axis Vibration Spectrum-Launch

# VIBRATION TEST RANDOM SPECTRUM

## 80 FILTER ANALYSIS

### ZONE I-C/M SPACE FLIGHT LEVEL

SHEET 5 OF 9  
 DATE May 2-1967 START TIME   
 FIXTURE NO. T-002657 VIBRATION SYST. NO. 1 CONTROL ACCEL ENDEVOR M/N 2133 PROCEDURE NO. SS-1626-R PARAGRAPH NO. 5.A.  
 TEST AXIS X TOTAL MINUTES: REQUIRED 12.5, ACTUAL 12.5 INPUT G RMS: REQUIRED 2.4, ACTUAL 2.4 AMBIENT CONDITIONS: PRESS. 29.65" Hg TEMP 77°F REL. HUMID. 63%  
 APOLLO TEST ENGINEER A.H. Lippig VIBRATION TECHNICIAN T.Warley AIRESEARCH QC MAA FIRST FILTER CENTER FREQ. 25 CPS  
 CROSSTALK: 0.0000 G RMS, 0.0000 G RMS; SPECIMEN: 0.0000 G RMS REMARKS

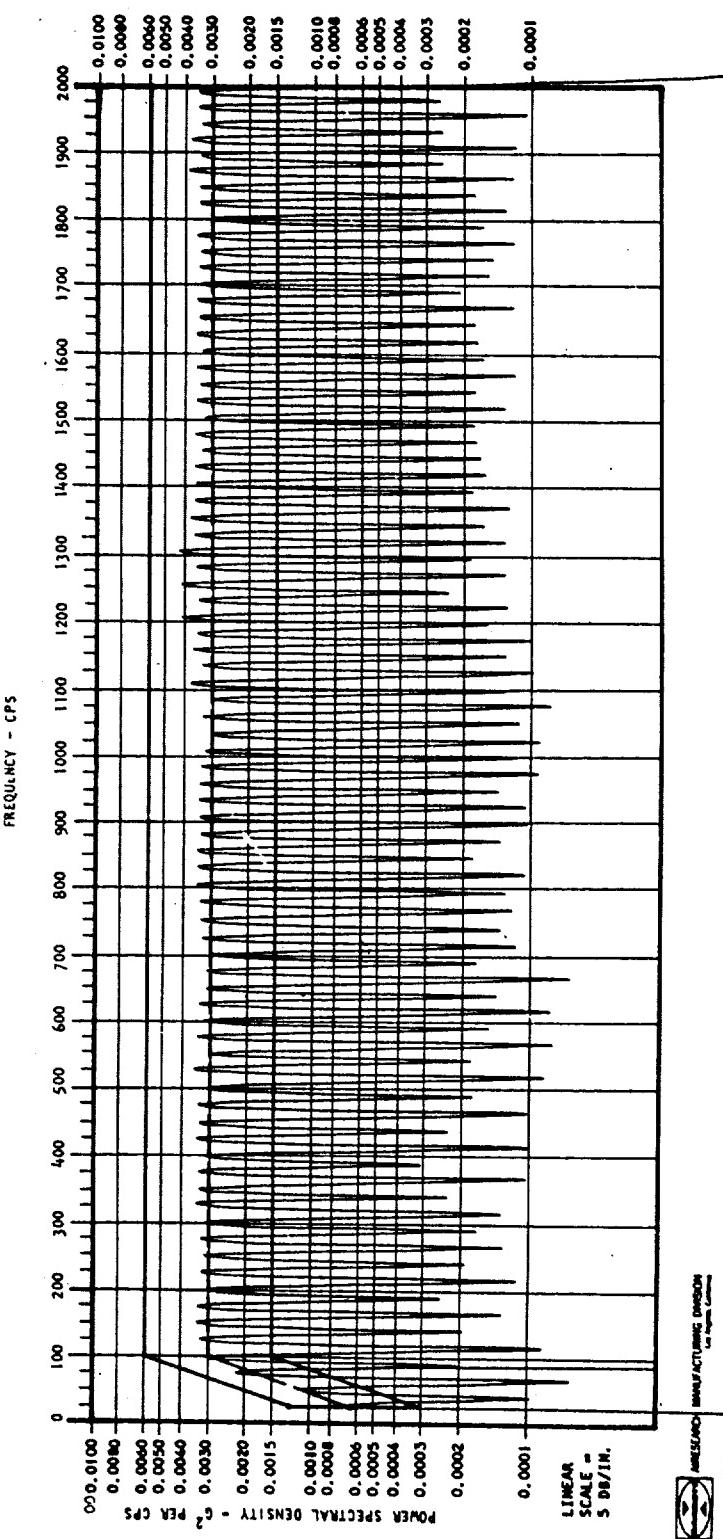


Figure 14. X Axis Vibration Spectrum-Flight



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

Figure 14 (Page 5 of 9)  
DTD-191  
Page 38

42

VIBRATION TEST RANDOM SPECTRUM  
 80 FILTER ANALYSIS  
 ZONE I-C/M HI-Q ABORT LEVEL

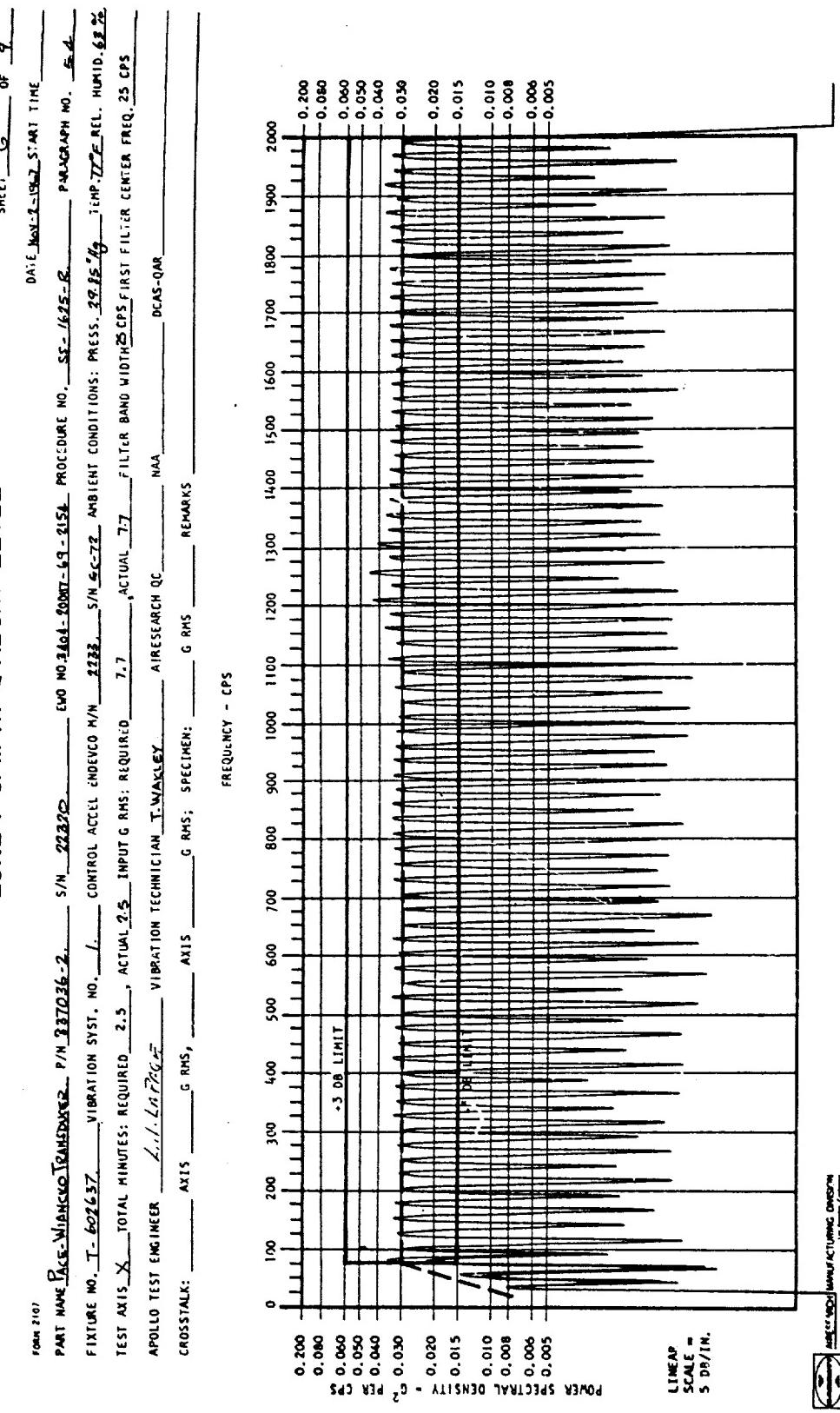


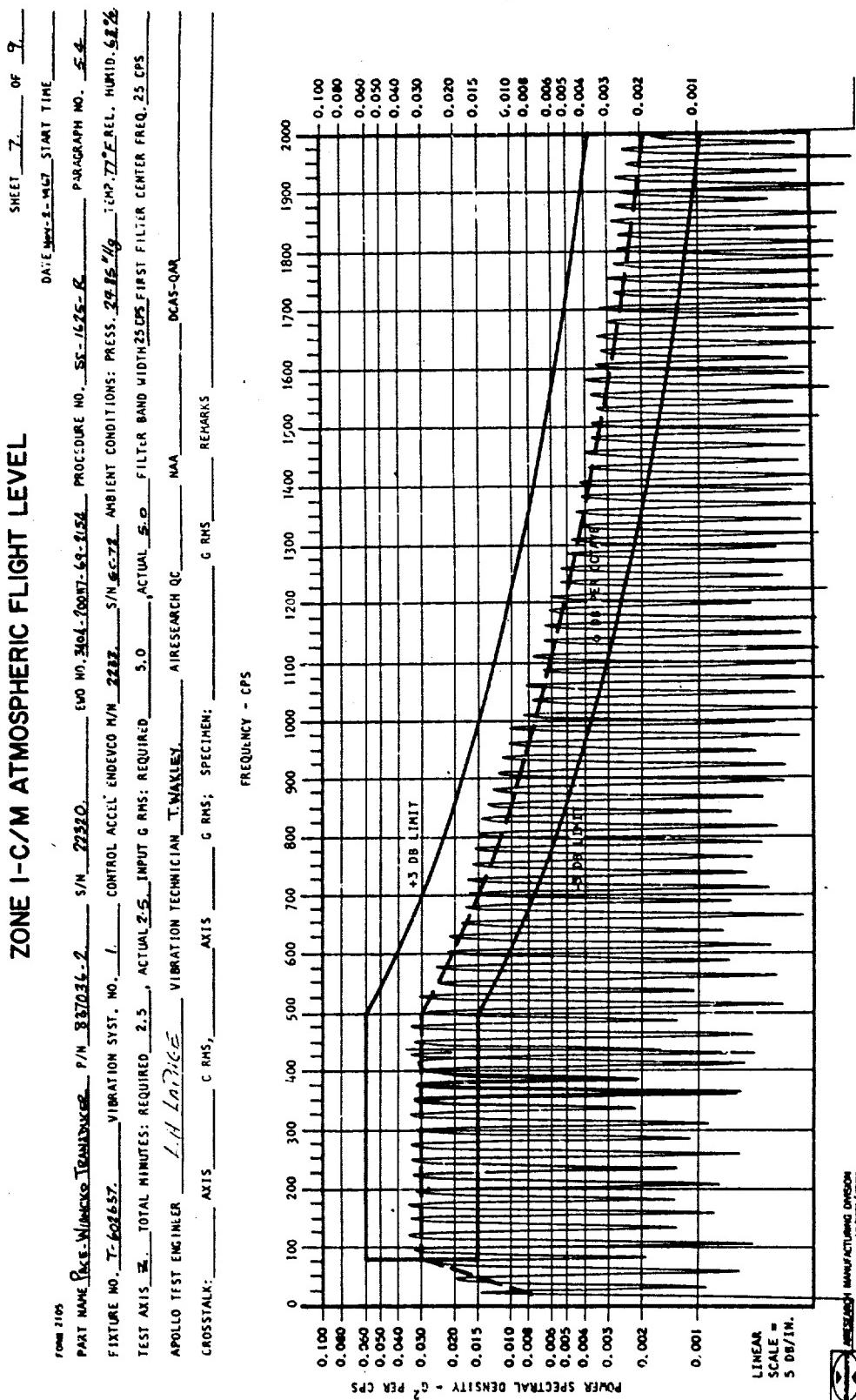
Figure 14. X Axis Vibration Spectrum-High Q Abort



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

Figure 14 (Page 6 of 9)  
 DTD-191  
 Page 39

**VIBRATION TEST RANDOM SPECTRUM**  
**80 FILTER ANALYSIS**  
**ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL**



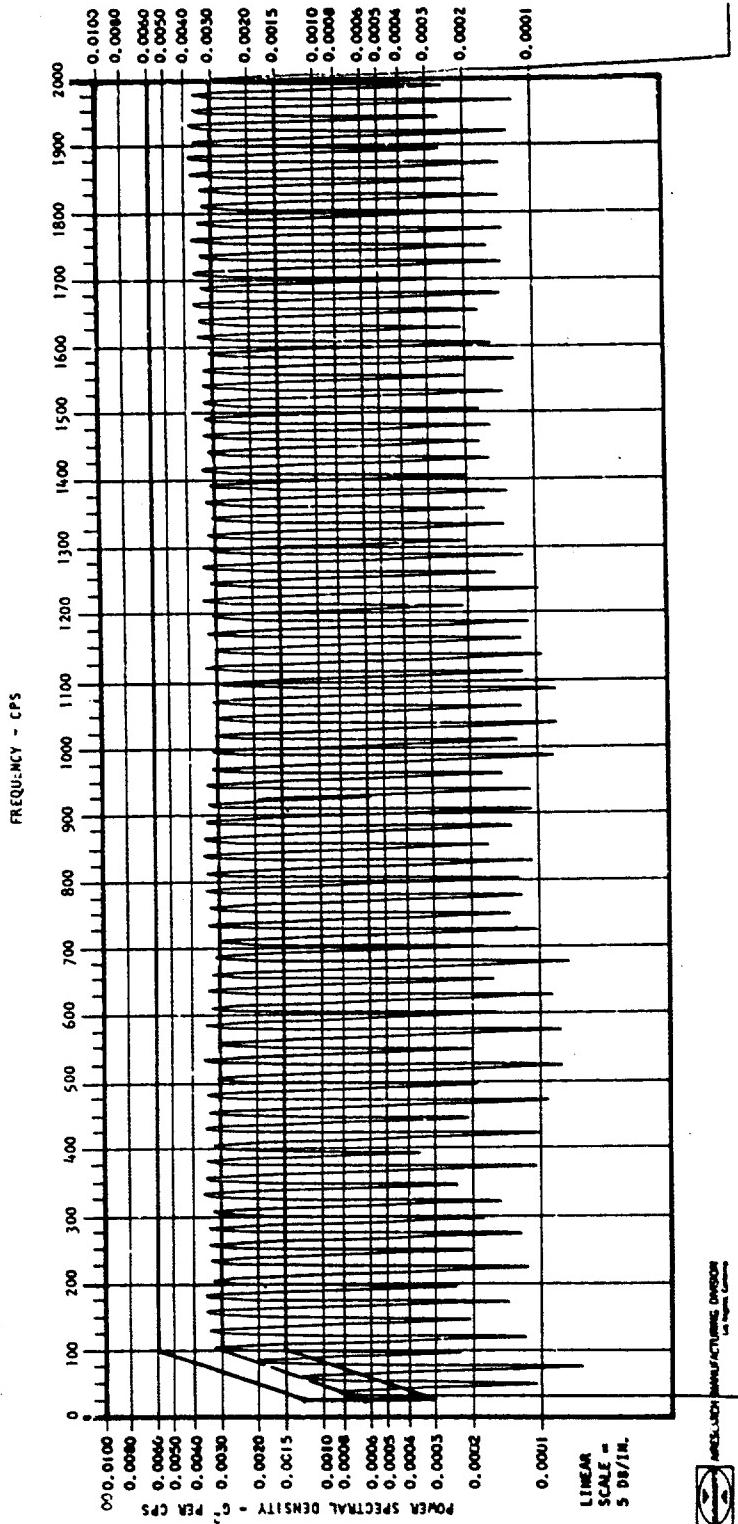
AIRESEARCH MANUFACTURING DIVISION  
 Los Angeles, California

Figure 14 (Page 7 of 9)  
 DTD-191  
 Page 40

Figure 14. Z Axis Vibration Spectrum-Launch

**VIBRATION TEST RANDOM SPECTRUM**  
**80 FILTER ANALYSIS**  
**ZONE I-C/M SPACE FLIGHT LEVEL**

PART NAME Per-Mianko Transducer P/N 837036-2. S/N 22380. EWD NO. 2664-20017-69-264. PROCEDURE NO. SS-1625-A.  
 PARAGRAPH NO. E-4.  
 FIXTURE NO. T-60265Z. VIBRATION SYST. NO. 1. CONTROL ACCEL ENDEVCO N/M 2223. S/N SEC-72. AMBIENT CONDITIONS: PRESS. 28.85" Hg TEMP. 77°F REL. HUMID. 68%.  
 TEST AXIS Z. TOTAL MINUTES: REQUIRED 12.5, ACTUAL 12.5 INPUT G RMS: REQUIRED 2.4, ACTUAL 2.4 FILTER BAND WIDTH CPS FIRST FILTER CENTER FREQ. 25 CPS  
 APOLLO TEST ENGINEER L.H. LIPKIN VIBRATION TECHNICIAN T. WAKLEY AIRESEARCH QC NAA  
 CROSSTALK: Axis G RMS: Axis G RMS: Specimen G RMS: REMARKS



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Los Angeles, California

Figure 14. Z Axis Vibration Spectrum-Flight

Figure 14 (Page 8 of 9)  
 DTD-191  
 Page 41

**VIBRATION TEST RANDOM SPECTRUM**  
**80 FILTER ANALYSIS**  
**ZONE I-C/M HI-Q ABORT LEVEL**

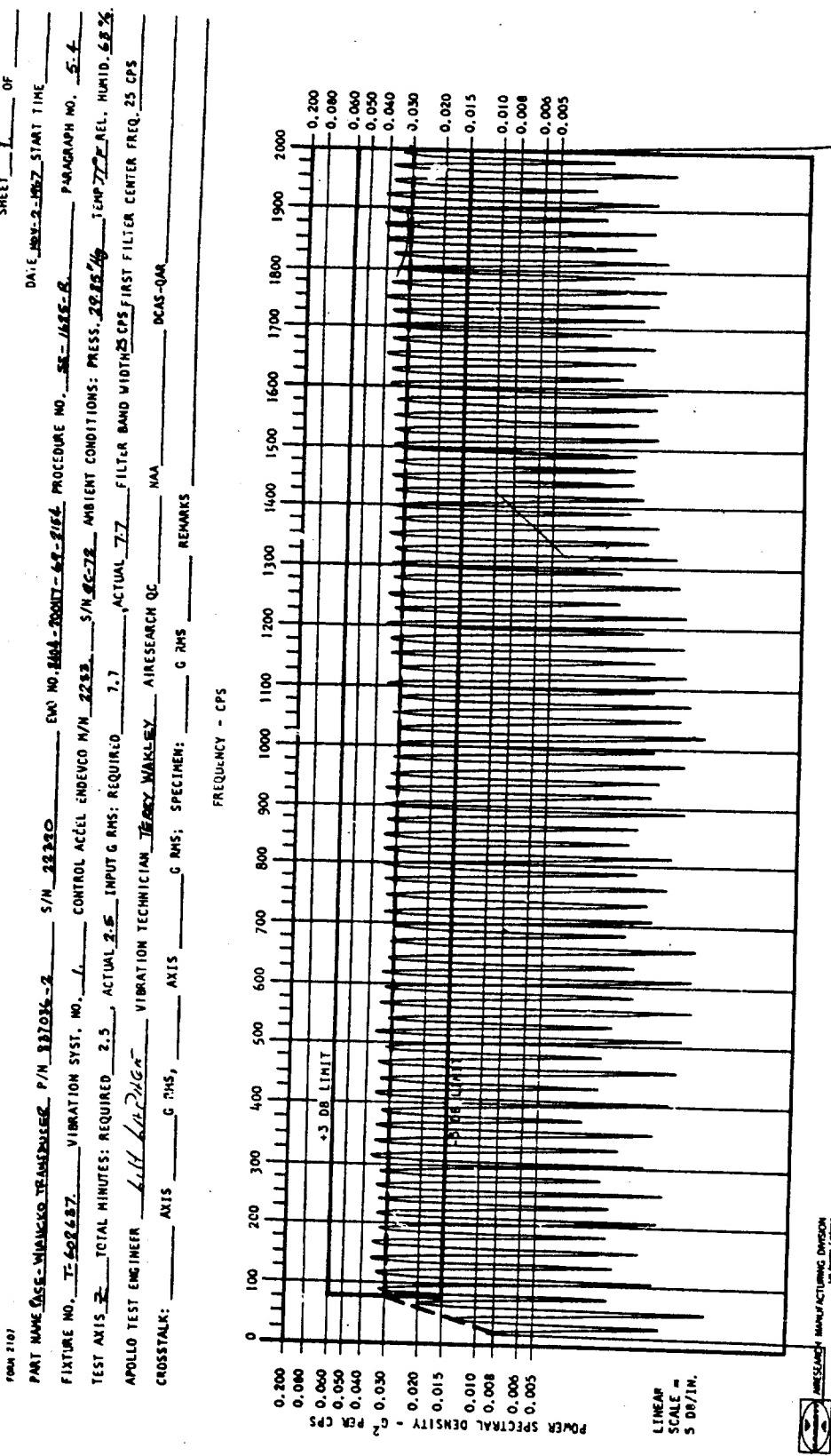
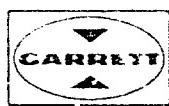
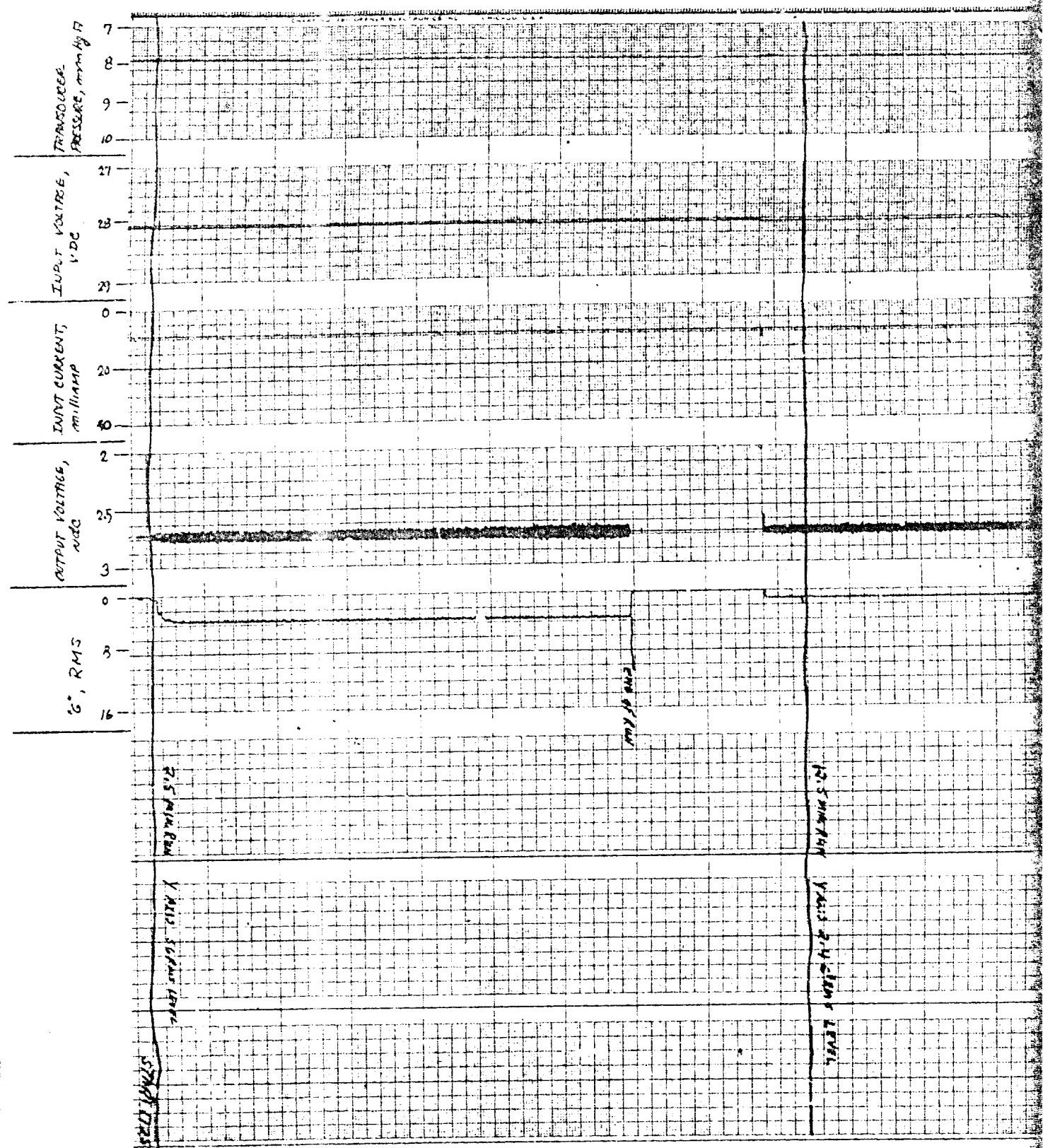


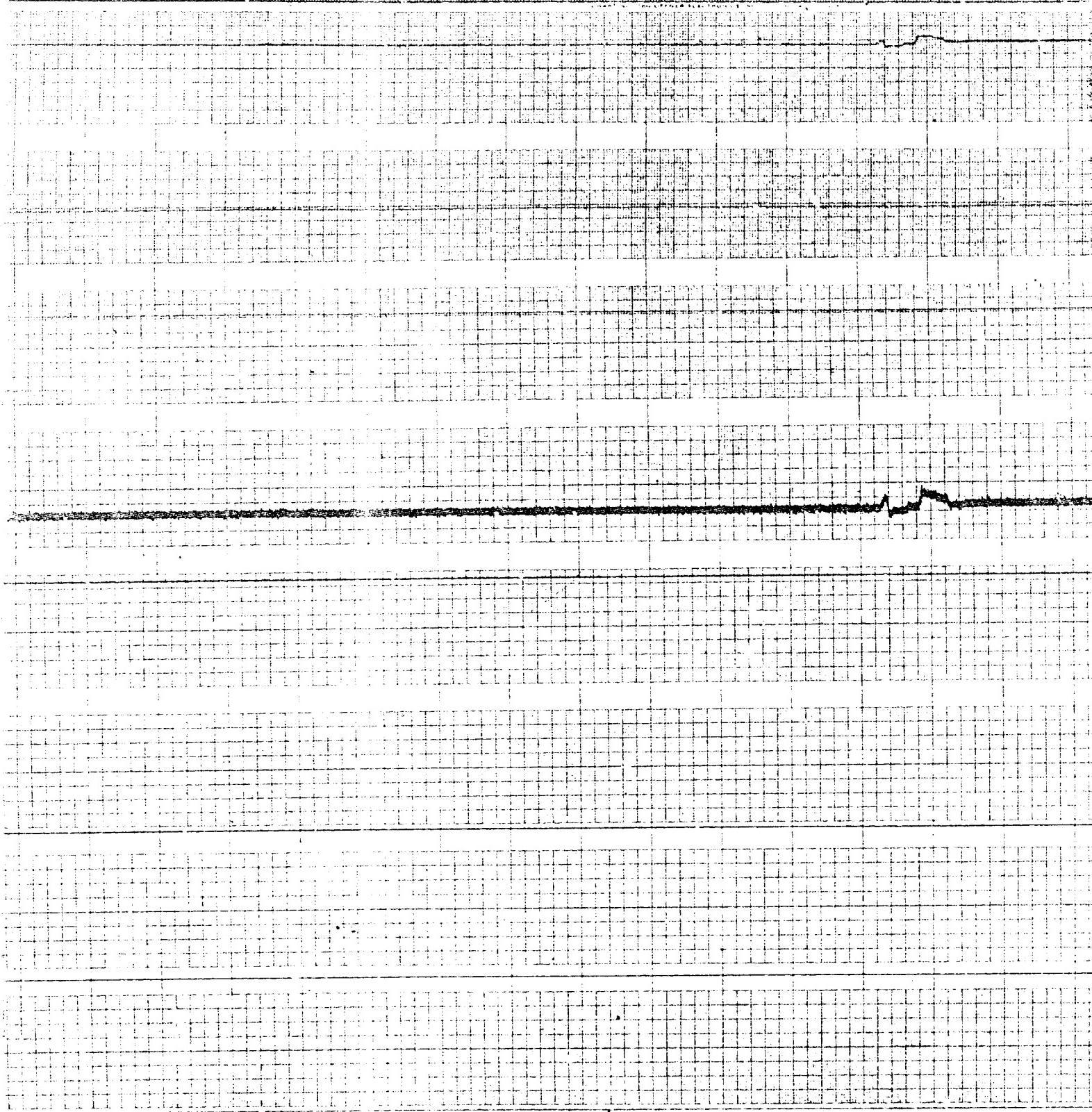
Figure 14. Z Axis Vibration Spectrum-High Q Abort

Figure 14 (Page 9 of 9)  
 DTD-191  
 Page 42

46



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Los Angeles, California



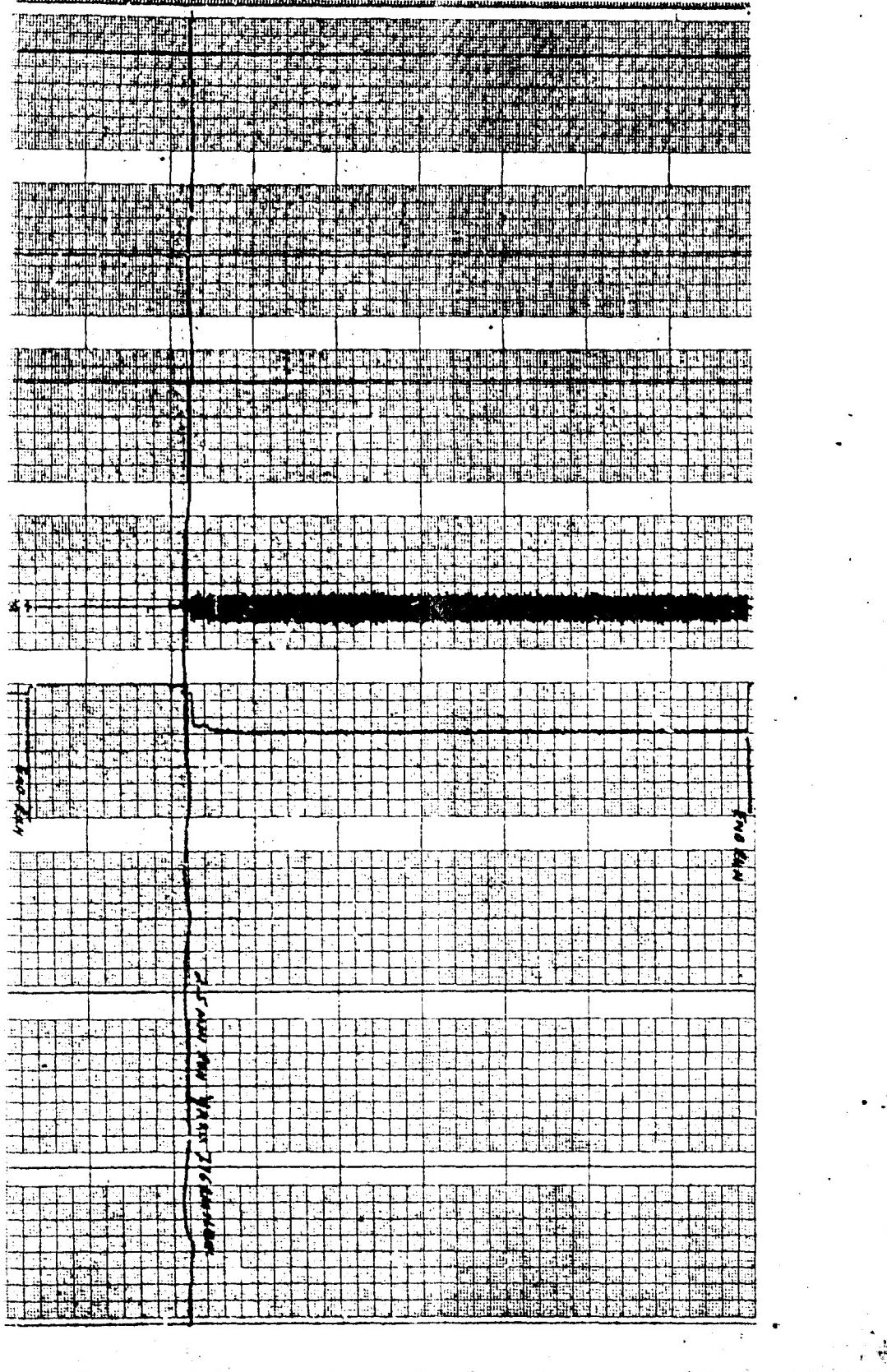
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CHEMICAL AND PETROGRAPHIC ANALYSIS

5 MILLIMETERS = 1 INCH



(c)

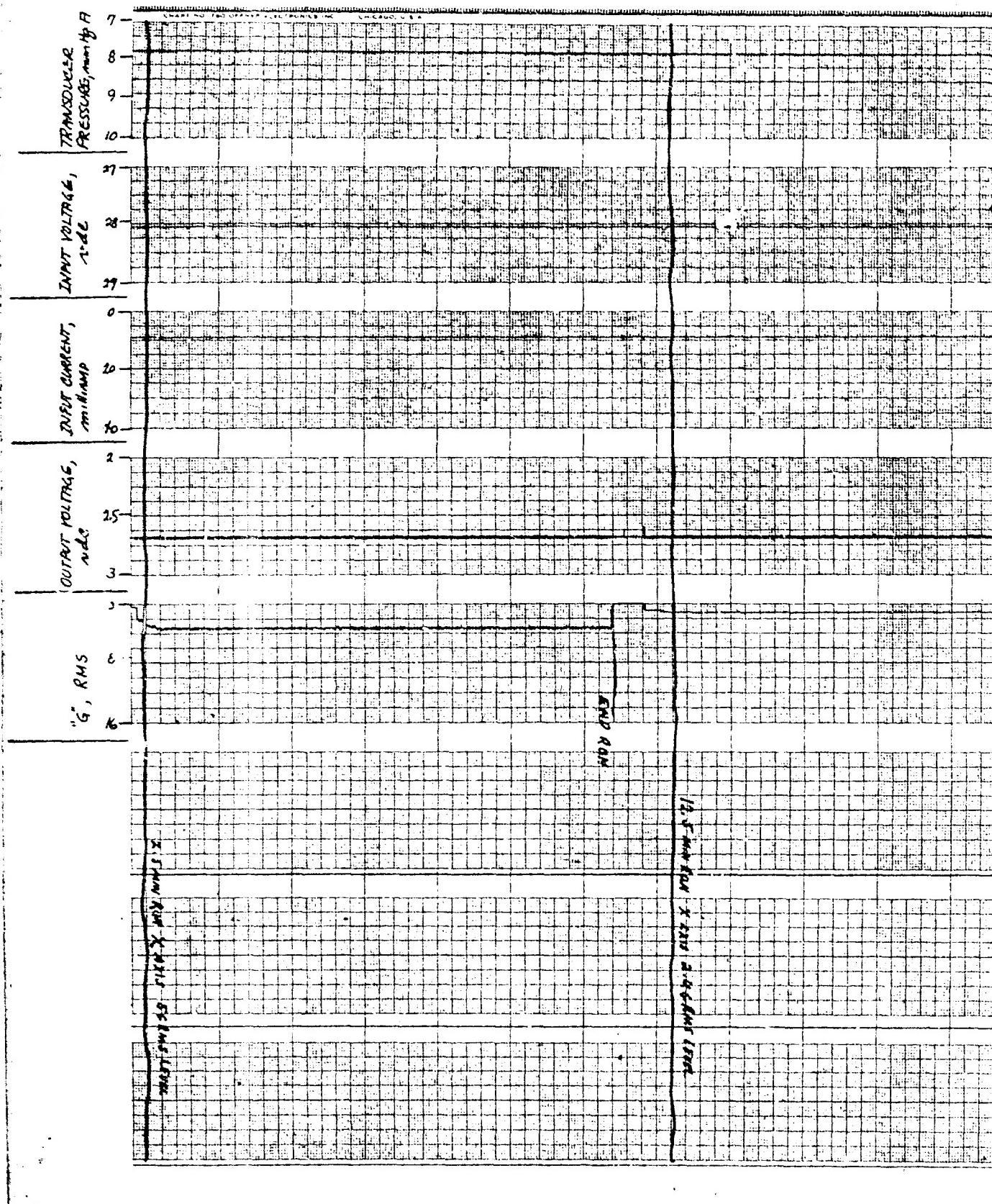


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D

DTD-191  
Page 43

Figure 15. Y Axis Vibration Test Results. P/N 837036-2, S/N 22320

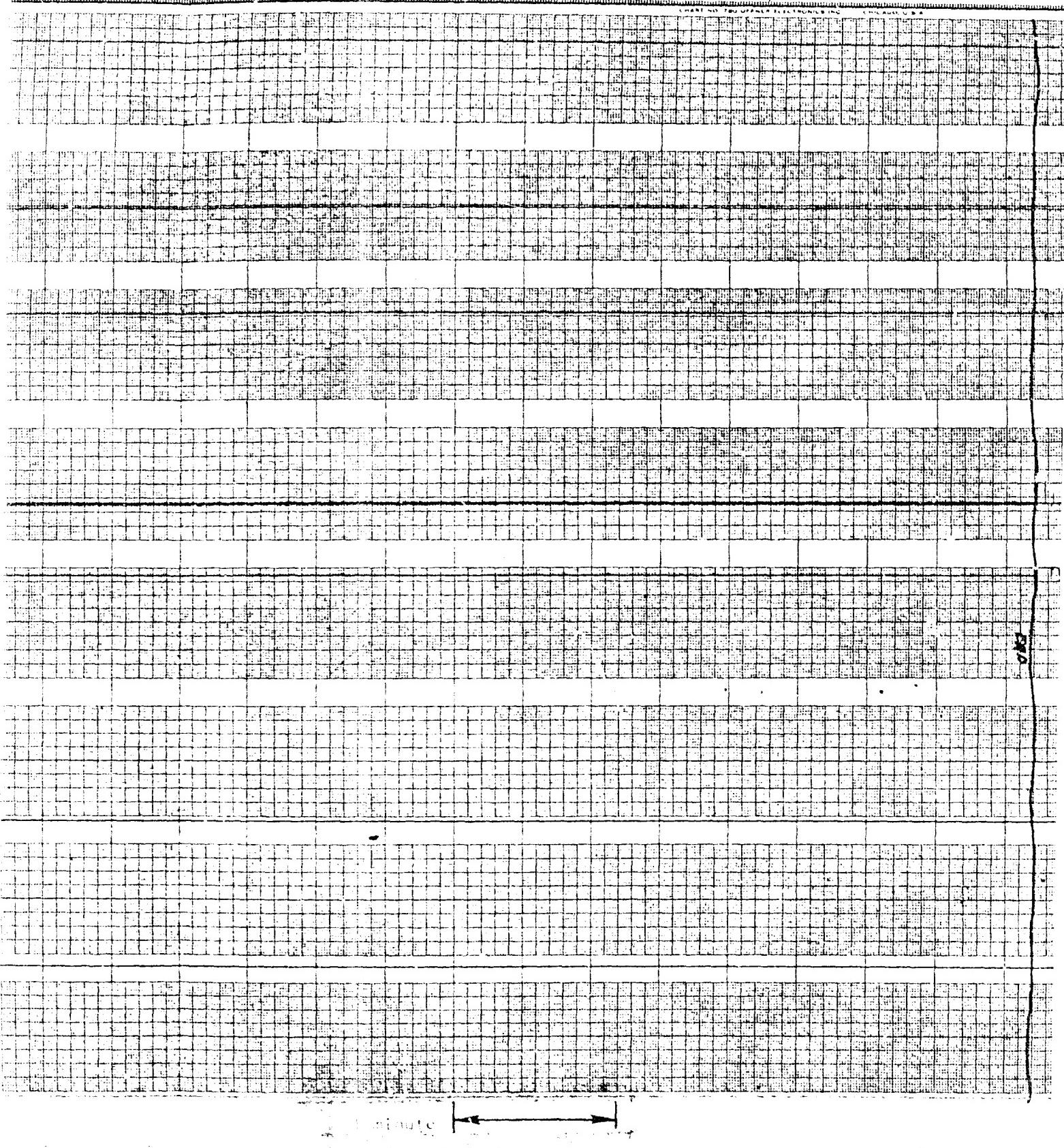


AIRESEARCH MANUFACTURING DIVISION  
 Los Angeles, California

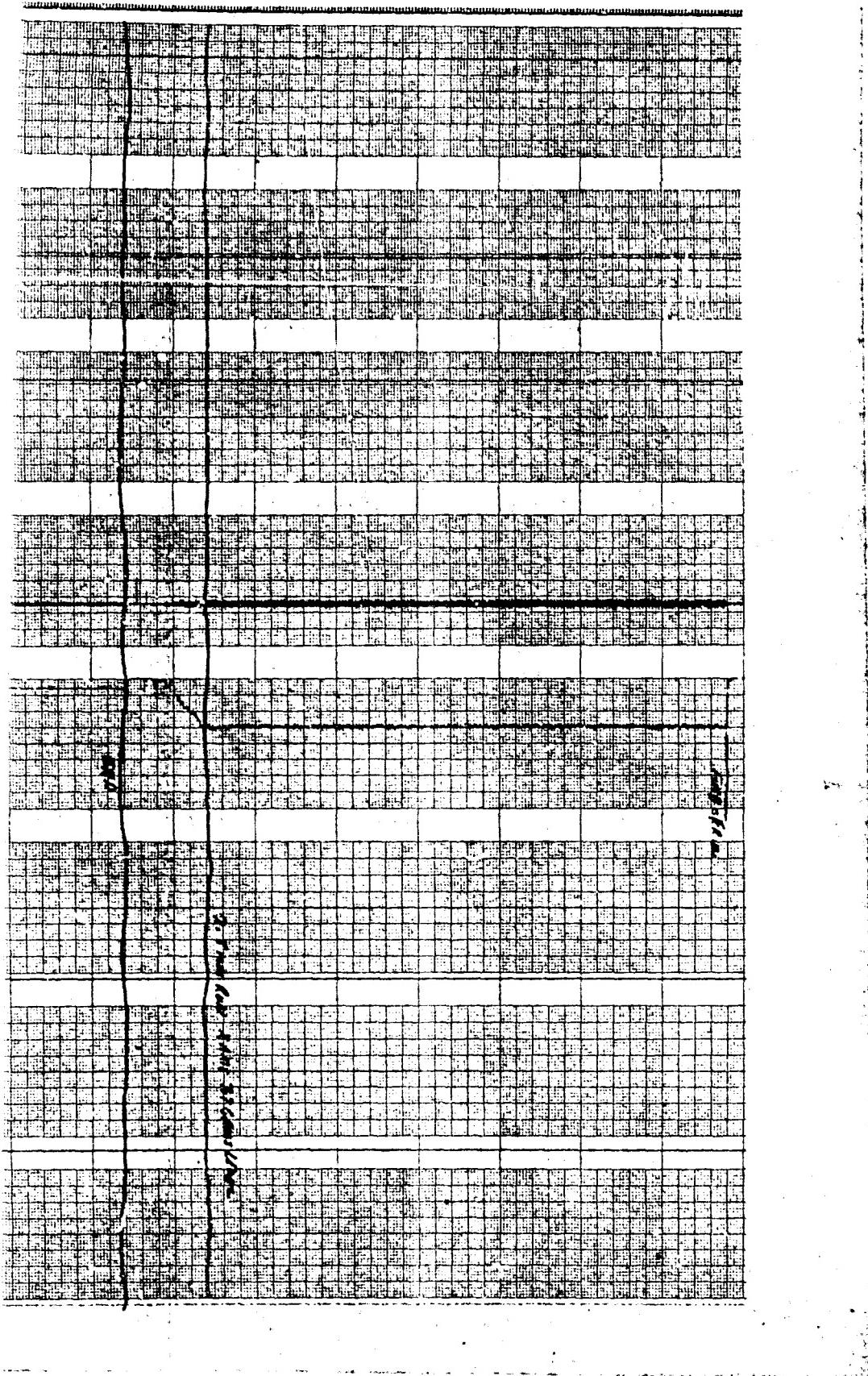
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CHART NO. F90-00000000000000000000

CHICAGO, U.S.A.



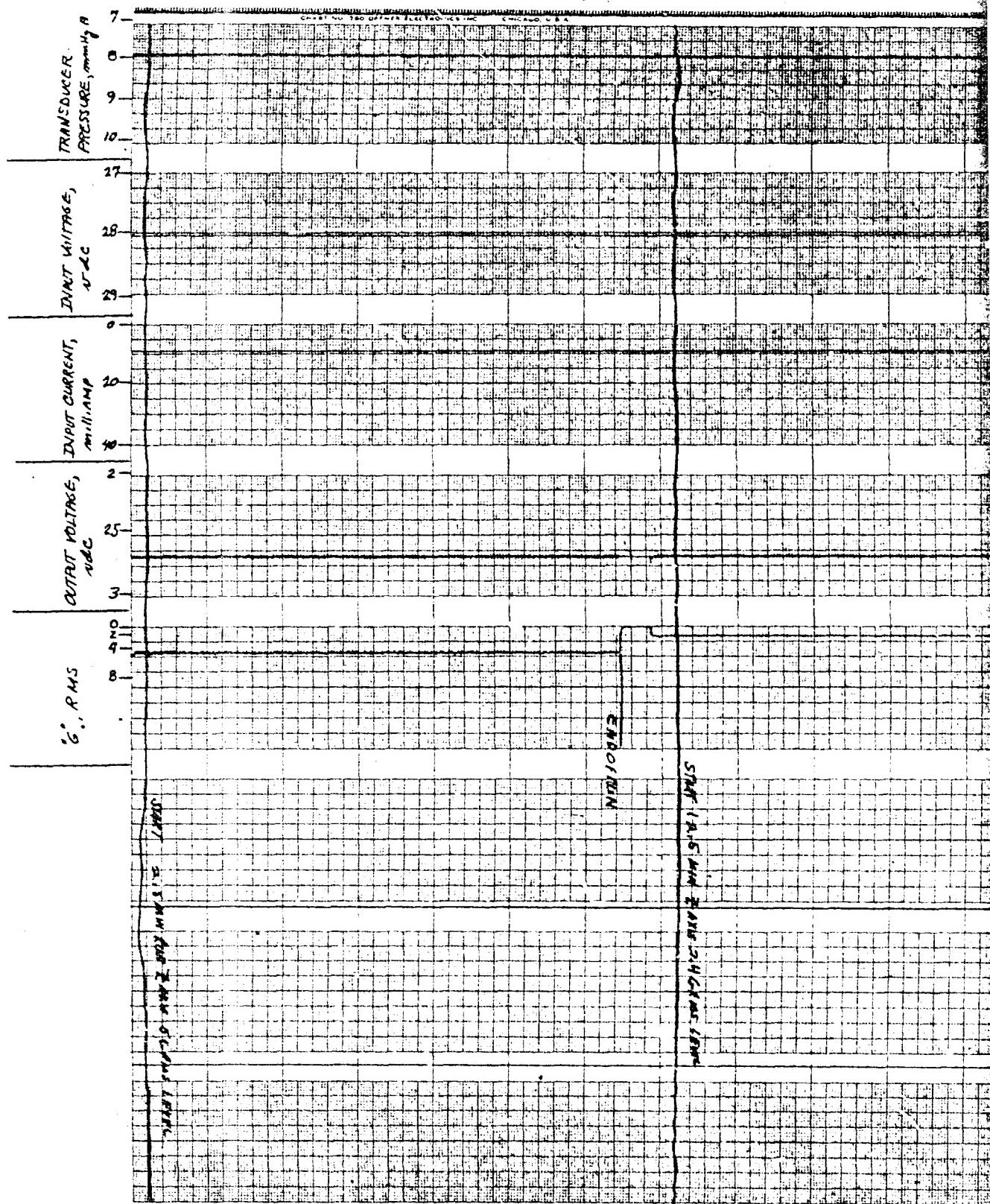
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Best Available Copy

Figure 15. X Axis vibration Test Results. P/N 837036-2. S/N 22320

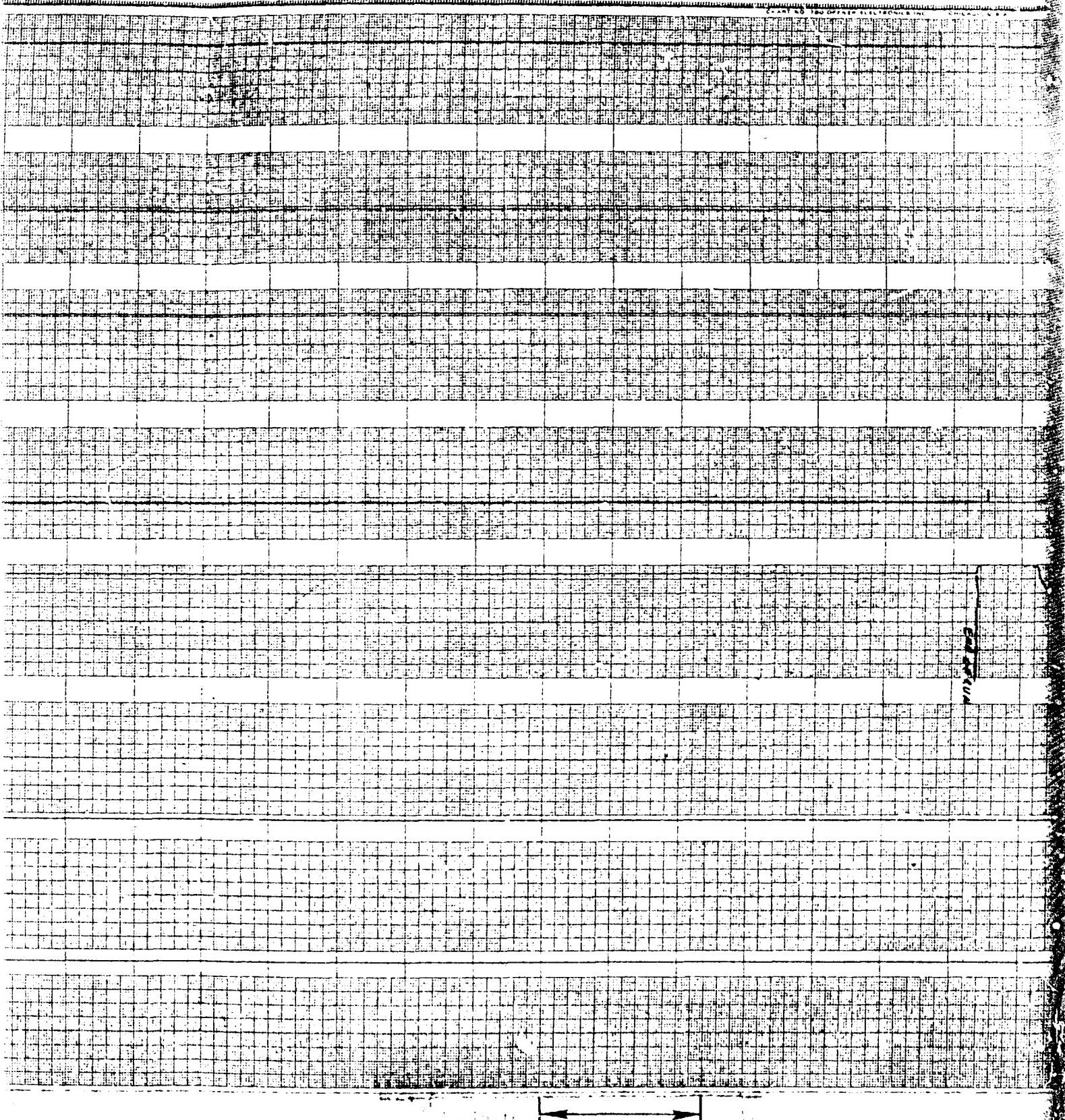
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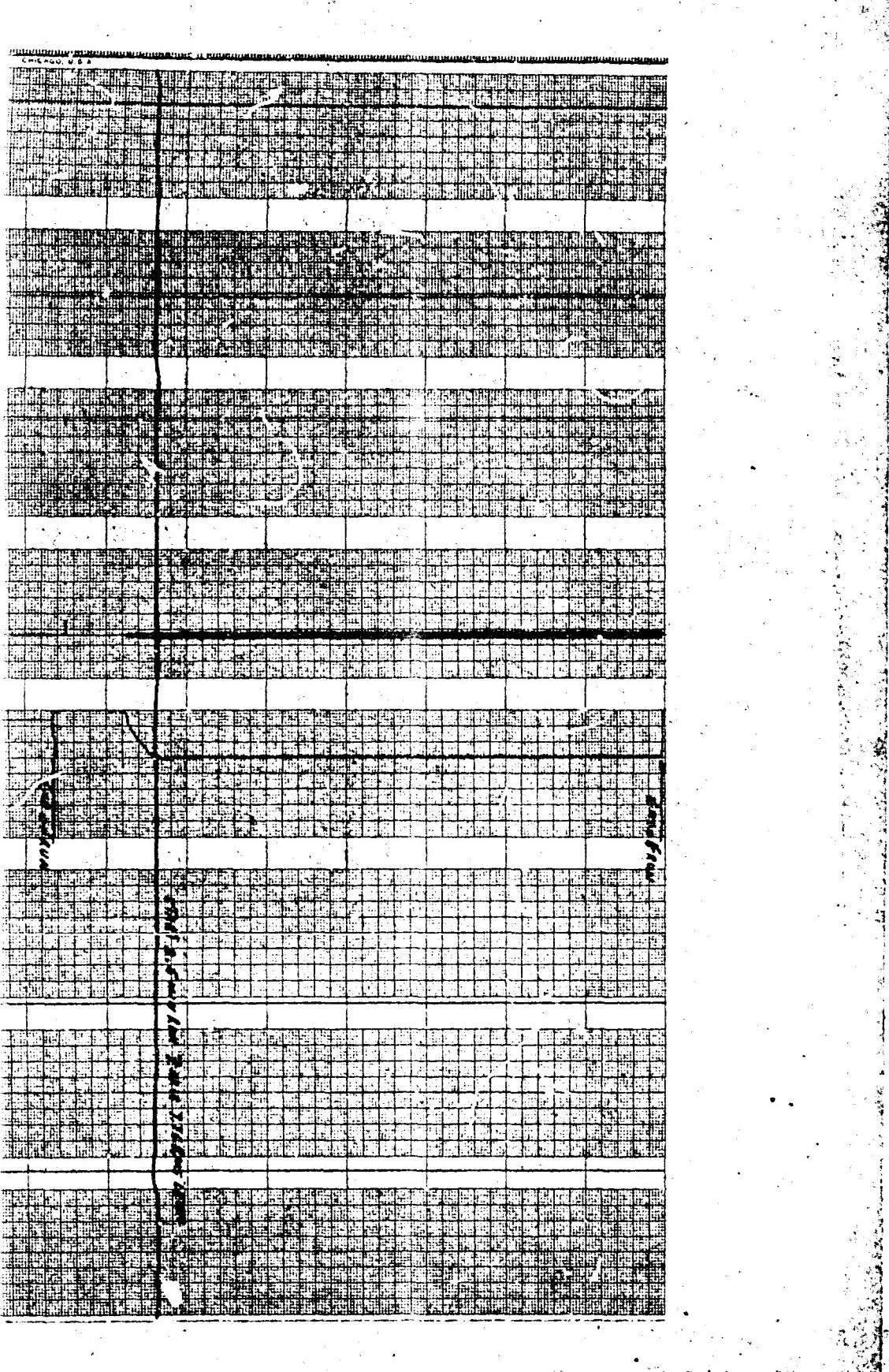


AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

CHART NO. 700 OFFICE ELECTRONICS INC. CHICAGO, U.S.A.

B





Best Available Copy

Figure 15. Z Axis Vibration Test Results. P/N 937036-2. S/N 22320

D

Interim Change Notice Letter: 8  
ATP No.: 88-1789-R  
Effective Date: 28-May-1987

83-1750-A  
Data Sheet  
1 of 5

**ACCEPTANCE TEST  
DATA SHEET**

**Use black ink. No  
erasures permitted.**

**STEAM DUCT PRESSURE TRANSDUCER 837086-1 Z - 1**

NAA-AKE. SPEC. ME NASA 004000022330

Part Number 837036-1-2 S/N 22320

Date 11-3-67 Barometer 29.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

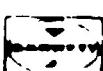
**Examination of Product:** **Accept** \_\_\_\_\_ **Reject** \_\_\_\_\_

Remarks: EWO-3404-200112-69-2154  
verification Test

Dimensional Check Verified: 11-3-61

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 32 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0060
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2320
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.47
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6900
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.980
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6900
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.465
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2330
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0020





F-8622

Figure 17. Shock Test Setup  
P/N 837036-2,  
S/N 22320



MONTEREY PARK, DIVISION

# OGDEN TECHNOLOGY LABORATORIES, INC.

Subsidiary of Ogden Corporation

21 NOVEMBER 1967

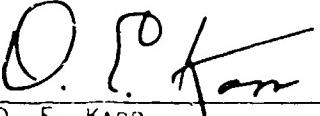
873 MONTEREY PASS ROAD, MONTEREY PARK, CALIFORNIA 91754  
TELEPHONE: 213 - 289-4425 TWX: 213 ~ 288-3123

## OGDEN TECHNOLOGY LABORATORIES REPORT NUMBER 22400

AIRESEARCH PURCHASE ORDER NUMBER 418-56664-7

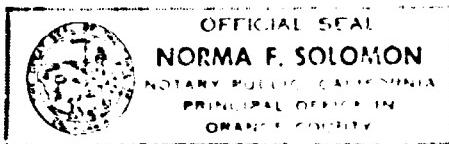
- A. TEST: DEVELOPMENTAL SHOCK
- B. SAMPLE: TRANSDUCER  
PART NUMBER 837036-2  
SERIAL NUMBER 22320
- C. SPECIFICATION: AIRESEARCH QUALIFICATION TEST PROCEDURE  
IMPACT SHOCK TEST, No. SS-1560-R,  
DATED 4 OCTOBER 1967, PARAGRAPH 5.6  
AND FIGURE 2
- D. RESULTS: THIS IS TO CERTIFY THAT THE SAMPLE WAS SUBJECTED  
TO THE SHOCK TEST IN ACCORDANCE WITH THE  
ABOVE SPECIFICATION.  
  
SINCE AIRESEARCH PERSONNEL PERFORMED ALL OF  
THE OPERATIONAL TESTS, OGDEN TECHNOLOGY  
LABORATORIES CANNOT CERTIFY THAT THE SAMPLE  
PASSED OR FAILED.

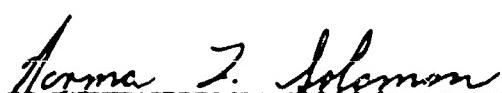
OGDEN TECHNOLOGY LABORATORIES

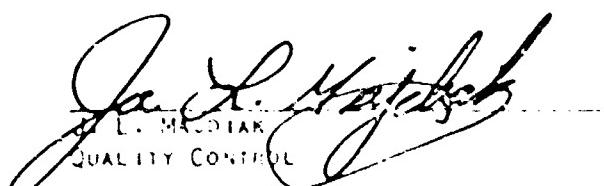


\_\_\_\_\_  
D. E. KARR  
OPERATIONS MANAGER

SUBSCRIBED AND SWORN TO BEFORE ME THIS 21ST DAY OF NOVEMBER 1967



  
Norma F. Solomon, Notary Public in and for the County of Orange, State of California. My commission expires March 6, 1971.



J. L. MATLAK  
QUALITY CONTROL

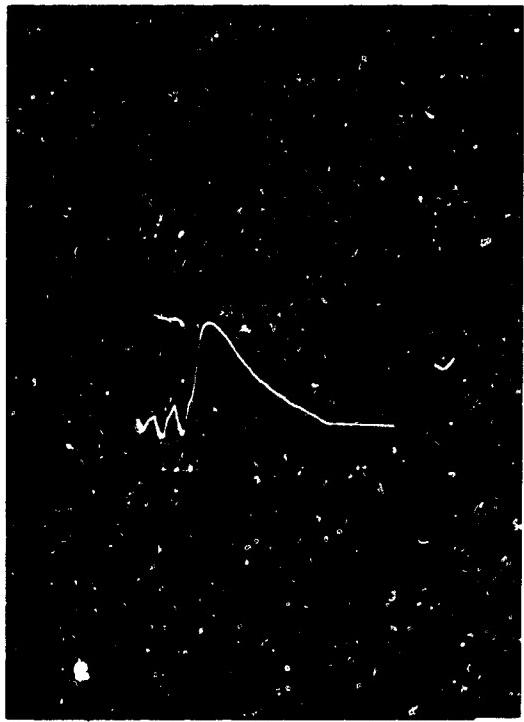
Figure 18 (Page 1 of 3  
DTD-121  
Page 48



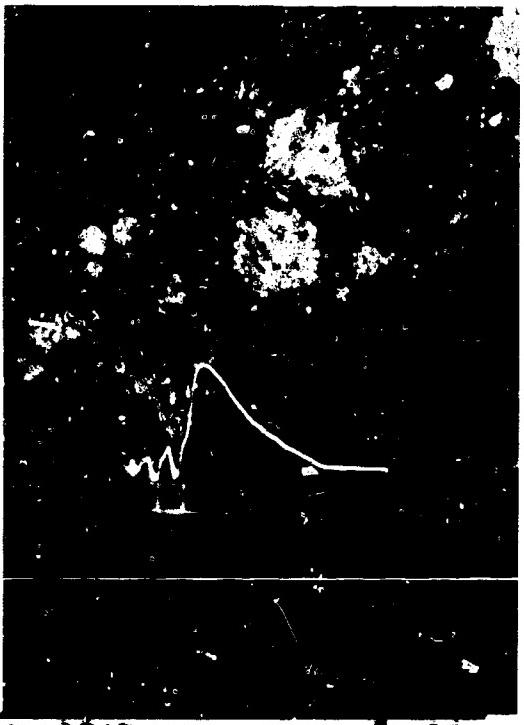
Figure 18 page 2 of 3  
DTD-191  
Page 49

EQUIPMENT LIST

DESCRIPTION	SYMBOL	UNIT	APPARATUS	CALIBRATION DUE DATE
<u>SHOCK TEST</u>				
SHOCK	--	--	TEKTRONIX OSCILLOSCOPE, MODEL 564, S.N. 003708	3/3/68 6 MONTHS
			ENDEVCO AMPLIFIER, MODEL 2614, S.N. FC12	1/11/68 3 MONTHS
			ENDEVCO ACCELEROMETER, MODEL 2213, S.N. JA26	1/11/68 6 MONTHS
			ROTOTEST LOW PASS FILTER, RTL No. E-3854	3/13/68 12 MONTHS
			BARRY CONTROLS SHOCK MACHINE, BEFORE USE TYPE 15575, S.N. 064, RTL No. F-7076-1	



76G IMPACT SHOCK X AXIS



CALIBRATION SHOCK PULSE F-0023

Figure 19. Shock Pulse Trace, P/N 837036-2, S/N 22320  
Time base = 2ms/cm, Amplitude = 20g/cm  
Vertical value = 76g, Horizontal value = 10 ms



ANERCAH MANUFACTURING CORPORATION

DTD-191  
Page 51

Interim Change Notice Letter: 'F  
ATP No.: 88-1789-R  
Effective Date: 22-May-1967.

88-1789-R  
Data Sheet  
1 of 3

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 887036-2.

NAA REF. SPEC. NR. NASA 004090022320

Part Number 887036-2 S/N 22320

Date 11-10-67 Barometer 29.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

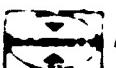
Examination of Product: Accept            Reject           

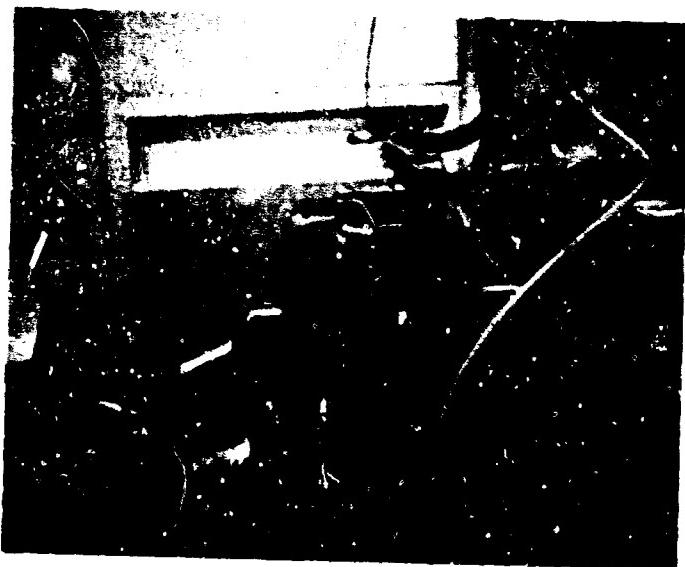
Remarks: EW 03404-200117-68-2154

Dimensional Check Verified: 11-10-67

Perf. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 321K Reject           

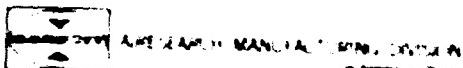
TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0060
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2310
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4530
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.668
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8820
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6670
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4520
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.230
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0040





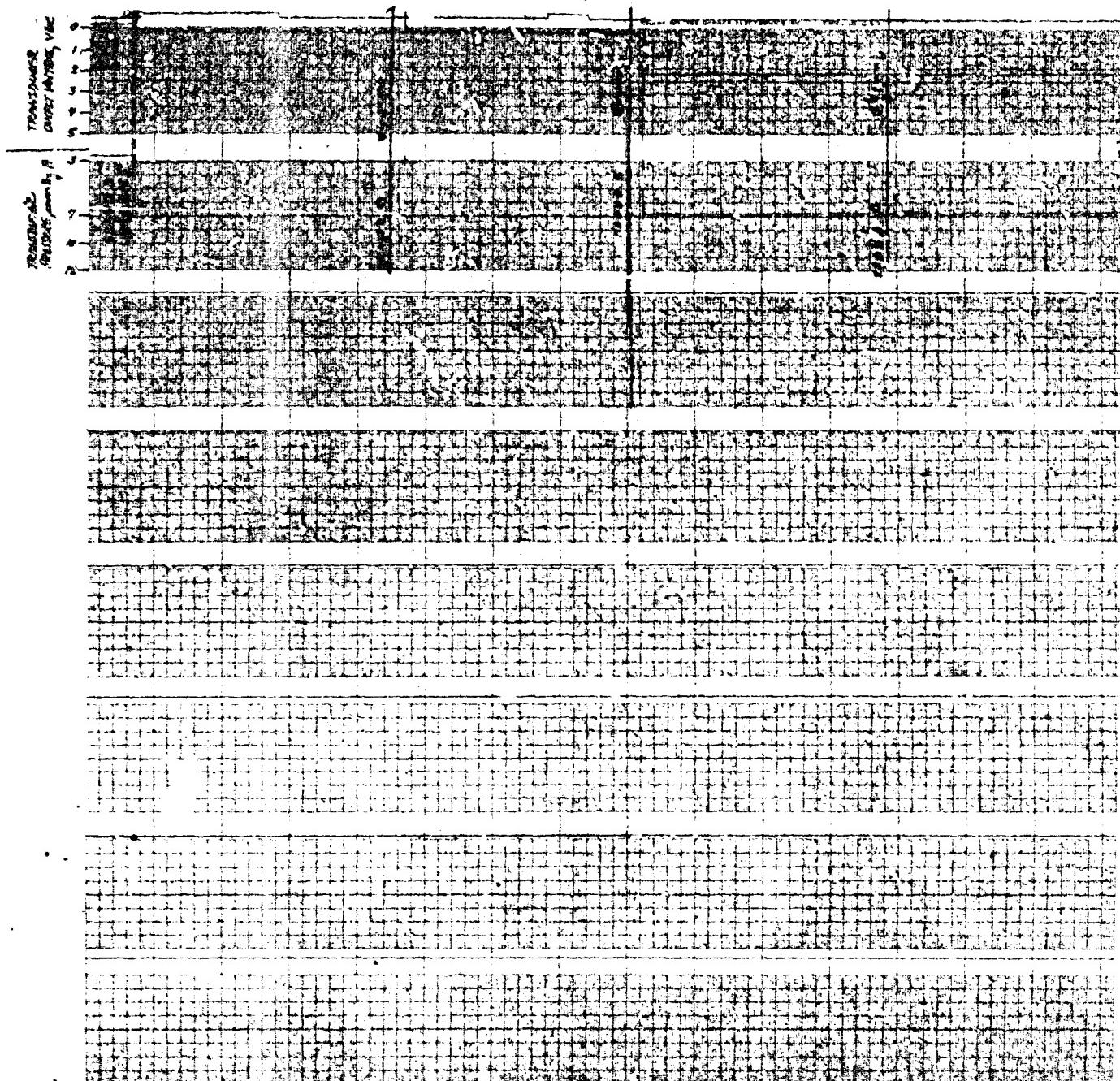
F-8620

Figure 21. Magnetic Field Effects Test  
P/N 837036-2, S/N 22320



AIR SEARCH MANUAL, SERIALIZED

DTD-191  
Page 53



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California



B

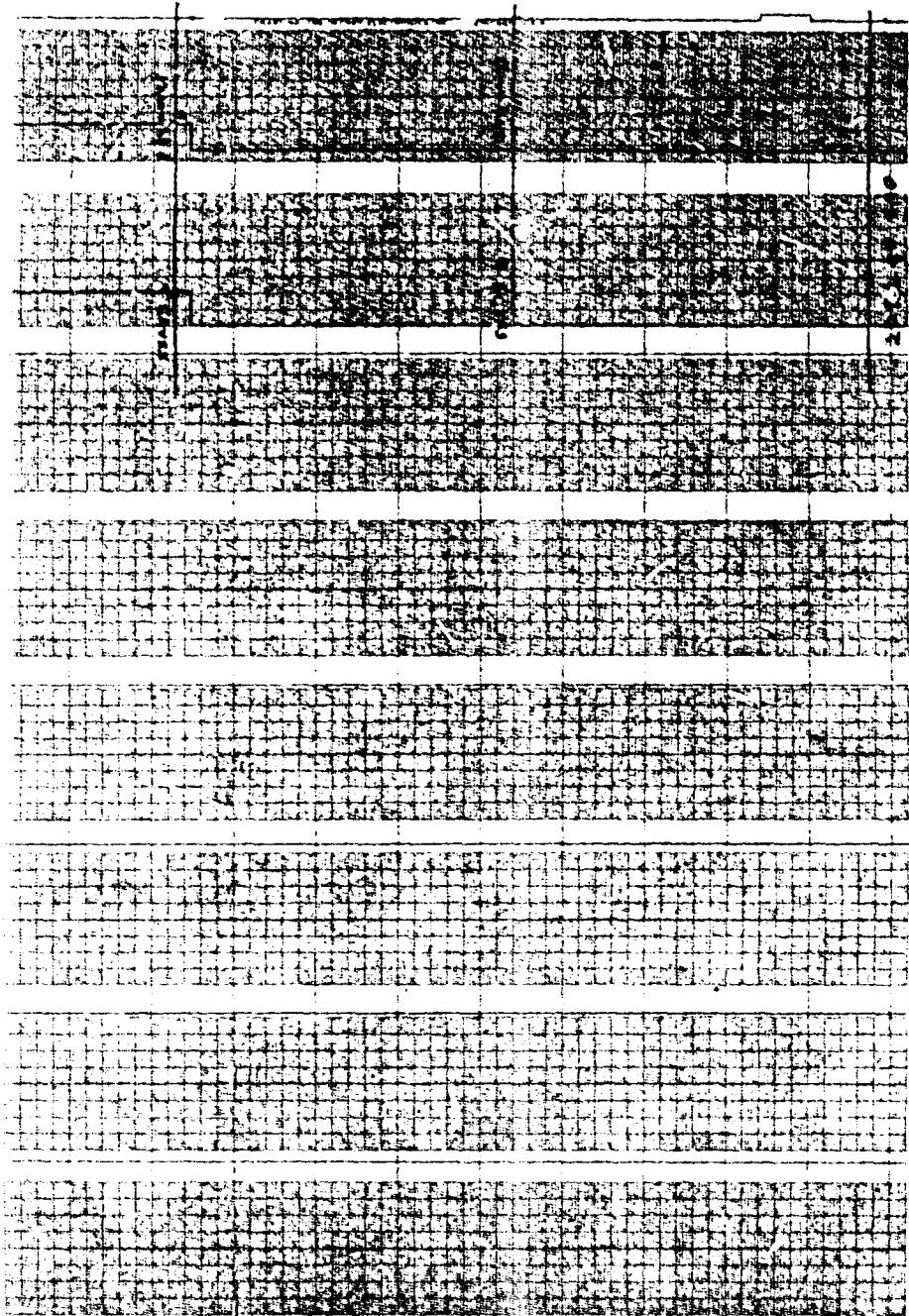


Figure 23. Magnetic Field Effect. P/I: 337535-2, S/N: 22320

Best Available Copy

C

D-191  
Page 54

**DEVELOPMENT TEST  
DATA SHEET**

P/N 837036-2, S/N 22320  
(MFG. BY PACE-WIANCKO)

**ATTITUDE TEST RESULTS**

Pressure MM Hg A	Attitude	Actual Output vdc	Acceptable Output vdc
3	X-	0.231	0.200 ±0.2
	X+	0.228	
	Y-	0.231	
	Y+	0.227	
	Z-	0.229	
	Z+	0.222	
7	X-	2.194	2.133 ±0.2
	X+	2.189	
	Y-	2.222	
	Y+	2.110	
	Z-	2.117	
	Z+	2.114	
10	X-	3.630	3.584 ±0.2
	X+	3.639	
	Y-	3.635	
	Y+	3.627	
	Z-	3.622	
	Z+	3.617	
12	X-	4.579	4.551 ±0.2
	X+	4.570	
	Y-	4.585	
	Y+	4.580	
	Z-	4.600	
	Z+	4.594	

Figure 23  
DTD-191  
Page 55



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

Interim Change Notice Letter: F  
ATP No.: 88-1759-R  
Effective Date: 28 May 1967

88-1759-R  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

NAA-NRF. SPEC. ME NASA DC4 000022321

Part Number 837036-2-1 S/N 22321

Date 13-2-8-67 Barometer 29.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept \_\_\_\_\_ Reject \_\_\_\_\_

Remarks: EW0 3404-200117-69-2154

Dimensional Check Verified: 1 2867

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept \_\_\_\_\_ Reject 10

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	-28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.4600 *
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.6170 *
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.7690 *
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.9190
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+5.0770
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.9270
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.775 *
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.6000 *
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.4210 *

\* OUT OF SPEC Readings



AIMSEARCH MANUFACTURING DIVISION

Figure 24  
DTD-191  
Page 56

WHITTAKER CORPORATION  
PACE WIANCKO DIVISION  
12838 SATICUY AVE.  
NORTH HOLLYWOOD, CALIF.

FORM NO. FR-1 PAGE 1  
Report No.

FR-66-67

FAILURE REPORT

PW PART NO.

60155

CUSTOMER:

Airesearch

CUSTOMER D.C. DOCUMENT NO. (INCLUDE REVISION NO.)

PART NAME:  
Transducer, Pressure,  
Absolute

SERIAL NO.

22321 & 22322

CUSTOMER PART OR DWG. NO.

837036-2-1 Rev. L

DATE OF FAILURE: POINT OF FAILURE; I.E. IN-PROCESS, ACCEPT., TEST, etc.

Airesearch

NATURE OF FAILURE: (COMPARE WITH ALLOWABLE TOL. LIMITS)

Positive shift in output.

TEST CONDITION, PREVIOUS HISTORY AND OPERATING TIME/NO. OF CYCLES  
(INDICATE TIME IN HOURS AND TENTHS)

N/A

FAILURE CAUSE:

Failure was verified.

IMMEDIATE DISPOSITION:

Perform failure analysis to determine cause and establish corrective action.

(ATTACH ADDITIONAL PAGES IF NECESSARY)

REPORTED BY

12-28

APPROVED BY

JL

FAILURE ANALYSIS REQ'D

NOT REQ'D



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles, California

Figure 25 (page 1 of 2)  
DTD-191  
Page 57

WHITTEAKER CORPORATION  
PACE WILANCO DIVISION  
12838 SATICOY STREET  
NORTH HOLLYWOOD, CALIF.

FORM NO. FR-2 PAGE 1

Report NO. FR-66-67

FAILURE ANALYSIS

PART NO. 601555      SERIAL NO. 22321      CUSTOMER P/N 837036-2-1 "L"

CUSTOMER S/N N/A      CUSTOMER Airesearch

ANALYSIS: The upward shift of the transducers output has been explained as an undesirable feature of the magnetic circuit that was used. Magnetic leakage through the case half formed a part of the path through the diaphragm back to the "E" core. Minor shifts in the "E" core position due to instability in the potting compound would cause a reading offset.

CORRECTIVE ACTION: S/N 22323 incorporates an inconel ring around the "E" core which provided a high reluctance path between the "E" core and the magnetically permeable stainless case half. In the new design the inconel ring provides a high reluctance path that removes case half leakage from the magnetic circuit and reduces the reading sensitivity to movement of the "E" core. As a result of the concentration of the magnetic field the output of the pickup is increased by a noticeable factor. In addition to this the movement of the diaphragm in S/N 22323 has been increased from approx. .0005 to .001 inch. This has increased output.

ANALYSIS PREPARED BY: J. J. G.      Title: 12-25-66      Date: 12-25-66

ANALYSIS APPROVED BY: J. J. G.      Title: Figure 25 (page 2 of 2)  
DTD-191  
Page 58

DEVELOPMENT TEST  
DATA SHEET

P/N 837036-2 S/N 22322  
(MFD BY PACE WIANCKO)

PRESSURE		OUTPUT VOLTS	
PSIA	INS Hg. A	NOMINAL	INITIAL CALIB. 10-4-67
.05	.10180	0	+ .060
.07	.14253	.5	.586
.09	.18325	1.0	1.091
.11	.22397	1.5	1.595
.13	.26469	2.0	2.094
.15	.30541	2.5	2.594
.17	.34614	3.0	3.091
.19	.38686	3.5	3.593
.21	.42758	4.0	4.089
.23	.46830	4.5	4.584
.25	.50903	5.0	5.073



AIRESEARCH MANUFACTURING DIVISION

Figure 26  
DTD-191  
Page 59

Interim Change Notice Letter: F  
ATP No.: 88-1739-R  
Effective Date: 28 May 1967

88-1739-R  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

NAA REF. SPEC. NO. NASA 004.000022322

Part Number 837036-2-1 S/N 22322

Date 11-1-67 Barometer 29.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility \_\_\_\_\_

Examination of Product: Accept        Reject       

Remarks: Per EWD 3404-200117-69-2154

Functional Verification

Dimensional Check Verified:        <sup>10</sup> <sub>-1.67</sub>

Per. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 3/113 Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.1030
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3370
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+3.5000 ±0.2000	+2.5560
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+5.7500 ±0.2000	+3.7620
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+8.0000 ±0.2000	+4.9190
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7600
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.5570
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3400
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.1030



Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
2 of 3

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

P/N P37036-2-1  
S/N 22322

NAA REF. SPEC. M

NASA 004000022322

11-1-67

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept 32113 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 ±0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept 32113 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 ±0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

11-1-67

Diode Test:

Accept 32113 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	+30.0
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	0.0
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	0.0

11-1-67

Maximum Output Voltage Test:

Accept 32113 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	+5.556

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
3 of 3

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22322

NAA REF. SPEC. ME NASA

Input Current Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SW1 at pos 1)	mA	40 max	17.5
Input current (SW1 at pos 2)	mA	40 max	0.0 <b>*</b>

Calibration Test: Accept 67 Select 37472

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.490
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3880
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.6000
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.8000
Specimen pressure	mm Hg abs	12.929	12.729
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9550
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7980
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.5980
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3800
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.1460

\*No current reading p.m.t.

Interim Change Notice Letter: F  
 ATP No.: SS-1759-R  
 Effective Date: 22 May 1967

SS-1759-R  
 Data Sheet  
 4 of 5

ACCEPTANCE TEST DATA SHEET (CONT) PN P37036-2-1  
 STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 SN 22322

NAA REF. SPEC. MR

NASA 004-000022322

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 ±0.2000	+1.3660
11f	Pressure (PS2)	In. Hg abs	1.0 ±0.5	1.0
11g	Output voltage	vdc	+1.2500 ±0.2000	+1.3620
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 ±0.2000	+1.3459
	(3) Pressure PS2	In. Hg abs	1.0 ±0.5	0.75
	(4) Time at test	hours	3	3

Input Voltage Variation Test:

Accept \_\_\_\_\_ Reject \_\_\_\_\_

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.500	2.586	+25.0 ±0.1	25.0	0.0000 ±0.2000	+0.1171
	2.586	+30.0 ±0.1	30.0	0.0000 ±0.2000	+0.1165
12.929	12.919	+25.0 ±0.1	25.0	+5.0000 ±0.2000	+4.9096
		+30.0 ±0.1		+5.0000 ±0.2000	+4.9090

Output Ripple Test:

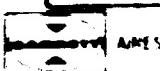
Accept 3747V Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mV rms	10 max	1.9

Isolation Resistance Test:

Accept 3747V Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	Megohms	100 min	4.2410



AEROSPACE MANUFACTURING DIVISION

Figure 27 page 4-15  
 DTD-1-11  
 Page 4-3

Inch-in Charge Notice Letter: F  
ATP No.: 56-1780-R  
Effective Date: 01/01/1987.

SS-1759-R  
Data Sheet  
8 of 9

ACCEPTANCE TEST DATA SHEET (CONT) P/N P37036-2-1  
STEAM DUCT PRESSURE TRANSDUCER 037036-2-1 S/N 22322

NAA REF. SPEC. ME

NASA 004000022322

#### **Insulation Resistance Test:**

Accept 31472 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	2.6E+10

Weight: \_\_\_\_\_ lb.

**Remarks:** \_\_\_\_\_

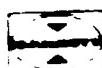
**Test Specimen Status:**

**Accept**      **Reject**

By

#### Inspection:

**AIRSEARCH Q.C.**      **NAA Q.C.**      **DCAS-QAR**



AMERICAN MUSEUM OF NATURAL HISTORY

Figure 1. Mean  $\delta^{13}\text{C}$  values

ENGLISH TEST BANK

# Geographia

Type Test RF Card. Page  
Sage ref.

Customer No. 111-111-1111

Specification 55-1313-R

**Project** 123456 **Test Order** 123456

Conducted by Captain 271812 Approved/Witnessed by \_\_\_\_\_

Date 11-11-62

Mississippi 122-116-111

24

Miscellaneous 100,000 u.v., 15-10,000 mc applied to each injector  
28vdc power line using the LISN. 400~ 30% Modulation used.

Test and Requirements: 111-606 (SE 582/4) & A153 Col Due 2-7-68

HP-6CPE 31N 710-00545 (4-25-68) + HP-612A 31N 573-C4704 (3-15-68)

NP-614A S/N 7211-03092 (4-10-68)      NP-610C S/N 148-01241 (4-11-68)

RR-618B 3/15/151-02920 (3-13-68) HH-620A 3/15/214-02566 (4-11-68)

728 Lijse

— 284 —

1-1124-A-8



AIRSEARCH MANUFACTURING DIVISION  
Los Angeles, California

Figure 28  
DTD-191  
Page 65

Interim Change Notice Letter: IF  
ATP No.: 88-1759-R  
Effective Date: 22 March 1967.

88-1759-R  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUST PRESSURE TRANSDUCER 837036-2-1

NAA-NBB, SPEC. NO. 1 NASA 064000022322

Part Number 837036-2-1 S/N 22-322

Date 12-12-67 Barometer 29.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept \_\_\_\_\_ Reject \_\_\_\_\_

Remarks: Dev. Findings only

Verification of out of Tolerance Condition

Dimensional Check Verified: During Steam Test.

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	(+0.2600)
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	(+1.5280)
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	(+2.7820)
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	(+4.0160)
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	(+5.186)
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	(+4.0160)
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	(+2.7810)
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	(+1.5260)
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	(+0.2580)

Printed or typed in ink only. Inkjet

Figure 29 (page 1 of 3)

DTD-191

Page 66



AIRESEARCH MANUFACTURING DIVISION  
Los Angeles California

Interim Change Notice Letter: F  
 ATP No.: SS-1759-R  
 Effective Date: 22 May 1963

SS-1759-R  
 Data Sheet  
 4 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
 STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22-322

NAA REF. SPEC. ME NASA \_\_\_\_\_

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	
	Output voltage	vdc	+1.2500 ±0.2000	
11f	Pressure (PS2)	in. Hg abs	1.0 ±0.5	
11g	Output voltage	vdc	+1.2500 ±0.2000	
11h	Specimen pressure	mm Hg abs	5.171	
	(1) Specimen pressure	mm Hg abs	5.171	
13b	(2) Output voltage	vdc	+1.2500 ±0.2000	
	(3) Pressure PS2	in. Hg abs	1.0 ±0.5	
	(4) Time at test	hours	3	

Input Voltage Variation Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586		+25.0 ±0.1		0.0000 ±0.2000	
		+30.0 ±0.1		0.0000 ±0.2000	
12.929		+25.0 ±0.1		+5.0000 ±0.2000	
		+30.0 ±0.1		+5.0000 ±0.2000	

Output Ripple Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	

Isolation Resistance Test: Accept 32113 / 12-12-67 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	110
Resistance	megohms	100 min	1.6 X 10 <sup>5</sup>



AIRESEARCH MANUFACTURING DIVISION  
 Los Angeles California

Interior Change Notice Letter: F  
ATP No.: SS-1750-R  
Effective Date: 12/12/67

SS-1750-R  
Data Sheet  
B of 4

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER BS7036-1

P/N \_\_\_\_\_  
S/N 22-322

NAA REF. SPEC. ME NASA

Insulation Resistance Test: Accept 32.113/12-12-67 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	Vdc	100	100
Resistance	Megohms	50 min	$1 \times 10^5$

Weight: 1b.

Remarks: \_\_\_\_\_

Test Specimen Status: Accept \_\_\_\_\_ Reject \_\_\_\_\_

By \_\_\_\_\_

Inspection: AIRSEARCH Q.C. NAA Q.C. DCAS-QAR



AIRSEARCH MANUFACTURING DIVISION

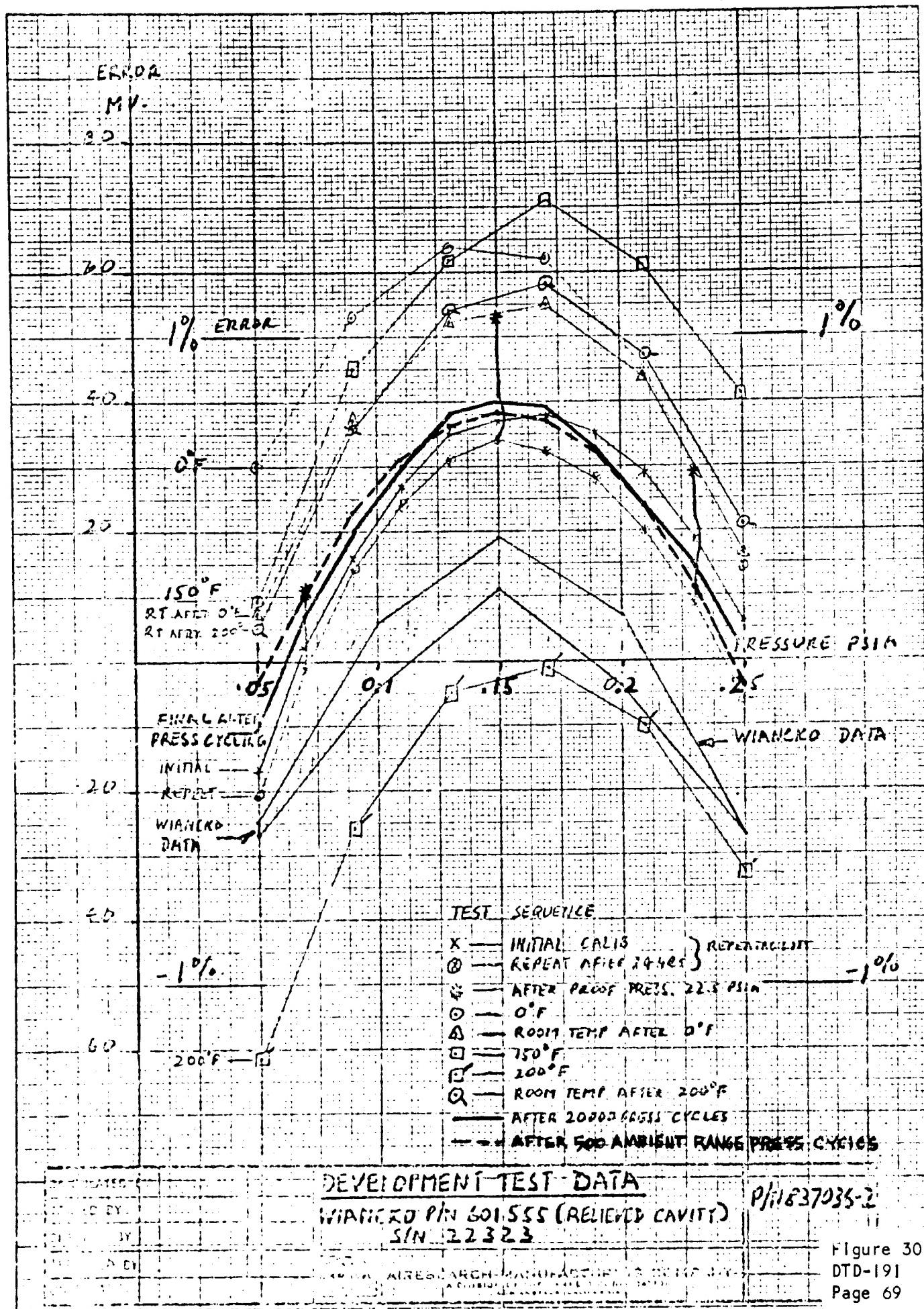


Figure 30  
DTD-191  
Page 69

Interim Change Notice Letter: F  
ATP No.: 88-1789-R  
Effective Date: 22 March 1967

88-1789-R  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-1

NAA-AFE. SPEC. ME NASA 224000022222

Part Number 837036-1 S/N 22323

Date 12-67 Barometer 29.92 In. Hg abs Amb Temp 70 °F

Tested by J. R. Baugh Test Facility 402

Examination of Product: Accept        Reject       

Remarks: \_\_\_\_\_

Dimensional Check Verified: \_\_\_\_\_

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept        Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	
Specimen pressure	mm Hg abs	2.586	
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	
Specimen pressure	mm Hg abs	7.737	
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	
Specimen pressure	mm Hg abs	12.929	
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	
Specimen pressure	mm Hg abs	7.737	
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	
Specimen pressure	mm Hg abs	2.586	
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	



AIRESEARCH MANUFACTURING DIVISION

Figure 31 (page 1 of 5)

DTD-191

Page 70

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
2 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 22236-2-1  
S/N 22223

NAA REF. SPEC. ME

NASA 20-3022-22222

OK FOR TEST  
1-2-61 H.Q.  
Proof Pressure Test (Nitrogen Gas Test Fluid): Accept  Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept  Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test:

Accept  Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	

Maximum Output Voltage Test:

Accept  Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	



AIR FORCE MANUFACTURING DIVISION  
Aerospace Division

Figure 31 (page 2 of 5)  
DTD-191  
Page 71

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
3 of 3

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2-1  
S/N 12323

NAA REF. SPEC. ME NASA 004000022325

Input Current Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SW1 at pos 1)	mA	40 max	
Input current (SW1 at pos 2)	mA	10 max	

Calibration Test: Accept 150 Reject 130

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0470
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2450
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.5170
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.7640
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9900
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7580
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.5140
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2430
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0440



AIRESEARCH MANUFACTURING DIVISION  
Airesearch Laboratories Inc.

Figure 31 (Page 3 of 3)  
DTD-171  
Page 12

Interim Change Notice Letter: F  
 ATP No.: SS-1739-R  
 Effective Date: 22 May 1968

SS-1739-R  
 Data Sheet  
 4 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
 STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2-1  
 S/N 22323

NAA REF. SPEC. ME NASA 004000022323

Calibration Test (cont)

OKFT130  
 1-3-68

DC 58

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 ±0.2000	+1.2430
11f	Pressure (PS2)	in. Hg abs	1.0 ±0.5	1.0
11g	Output voltage	vdc	+1.2500 ±0.2000	1.2430
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 ±0.2000	1.241
	(3) Pressure PS2	in. Hg abs	1.0 ±0.5	0.9
	(4) Time at test	hours	3	3

Input Voltage Variation Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586		+25.0 ±0.1		0.0000 ±0.2000	
		+30.0 ±0.1		0.0000 ±0.2000	
12.929		+25.0 ±0.1		+5.0000 ±0.2000	
		+30.0 ±0.1		+5.0000 ±0.2000	

Output Ripple Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mV rms	10 max	

Isolation Resistance Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_ DC 58

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	MΩ ohms	100 min	8.5 X 10 <sup>4</sup>



ANALYST MANUFACTURING DIVISION

Figure 31 - Page 4 of 4  
 DTD-1-1  
 Page 25

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 10/10/68

SS-1759-R  
Data Sheet  
8 of 8

ACCEPTANCE TEST DATA SHEET (CONT) PM \_\_\_\_\_  
STEAM DUCT PRESSURE TRANSDUCER 837036-1 S/N \_\_\_\_\_

NAA REF. SPEC. ME NASA

Insulation Resistance Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	
Resistance	megohms	50 min	

Weight: \_\_\_\_\_ lb.

Remarks: \_\_\_\_\_

Test Specimen Status:

F 1-3-68  
Accept i32 Reject \_\_\_\_\_

By \_\_\_\_\_

Inspection: Charles Brown 1/1  
AI Research Q.C. NAA Q.C. DCAS-QAR

QC 58



AI RESEARCH MANUFACTURING DIVISION

Engineering Department  
ETL-141  
Page 1

Interim Change Notice Letter: F  
ATP No.: 58-1799-R  
Effective Date: 22-May 1967.

58-1799-R  
Data Sheet  
1 of 8

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 587056-1 - 2-1

NAA-AE. SPEC. NR 449-0059-0001 NASA 0C4000022323

Part Number 837036-2 S/N 22-323

Date 1-8-68 Barometer 29.92 in. Hg abs Amb Temp 72 °F

Tested by L. Jenkins Test Facility 1402

Examination of Product: Accept \_\_\_\_\_ Reject \_\_\_\_\_

Remarks: \_\_\_\_\_

Dimensional Check Verified: \_\_\_\_\_

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	.dc	+28.0 ±0.5	
Specimen pressure	mm Hg abs	2.585	
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	
Specimen pressure	mm Hg abs	7.757	"
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	
Specimen pressure	mm Hg abs	12.929	
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	
Specimen pressure	mm Hg abs	7.757	
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	
Specimen pressure	mm Hg abs	2.585	
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	



AM-SARH MARKETING DIVISION

Engineering Services  
1700  
Palo Alto

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
2 of 5

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22-323

NAA REF. SPEC. ME 444-0054-0001 NASA 004000022323

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept        Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept        Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: Accept        Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	

Maximum Output Voltage Test: Accept        Reject       

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+0.5 max	

Interim Change Notice Letter: F  
 ATP No.: SS-1759-R  
 Effective Date: 22 May 1967

SS-1759-R  
 Data Sheet  
 3 of 3

ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1  
 STEAM DUCT PRESSURE TRANSDUCER 837036-X S/N 22-323

NAA REF. SPEC. ME 1419-C 059-0001 NASA 004000022323

Input Current Test:

Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SW1 at pos 1)	mA	40 max	
Input current (SW1 at pos 2)	mA	40 max	

Calibration Test:

Accept QC 58 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.1108
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1832
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4517
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6920
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9094
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6919
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4473
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1812
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.1097

CALIBRATION RUN AFTER FIRST DISTILLED  
 WATER EXPOSURE.



AIRESEARCH MANUFACTURING DIVISION

Long Beach, California

Figure 32 (Page 3 of 4)  
 DTD-191  
 Page 77

Interim Change Notice Letters F  
ATP No.: SS-1780-R  
Effective Date: 22 SEP 1967

SS-1780-R  
Data Sheet  
6 of 8

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2-1  
S/N 22-323

NAA REF. SPEC. ME 499-0059-0001 NASA 004000022323

Insulation Resistance Test:

Accept QC 58 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	$1.5 \times 10^5$

Weight: 1b.

Remarks: FT stamp entered by mistake by technician HQ

Test Specimen Status:

Accept QC 58 Reject \_\_\_\_\_

By \_\_\_\_\_

Inspection: QC 58

John Julian

AIR Research Q.C.

NAA Q.C.

DCAS-QAR



AIR RESEARCH MANUFACTURING DIVISION

Figure 52 (Page 1 of 1)  
D10-191  
Page 1/1

Interim Change Notice Letter: F  
ATP No.: 88-1759-R  
Effective Date: 22-May 1967

88-1759-R  
Data Sheet  
1 of 5

ACCEPTANCE TEST  
DATA SHEET

Use black ink. No  
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 887036-1

NAA REF. SPEC. ME NASA 004000022323

Part Number 887036-2 S/N 22323

Date 1-12-68 Barometer 28.92 in. Hg abs Amb Temp 70 °F

Tested by T. KARRELL Test Facility 1402

Examination of Product: Accept (A) Reject \_\_\_\_\_

Remarks: RESEARCH

Dimensional Check Verified: A

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept (A) Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0930
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1980
Specimen pressure	mm Hg abs	7.737	7.737
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4700
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.7100
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9300
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7100
Specimen pressure	mm Hg abs	7.737	7.737
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4660
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1960
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.1005



NAA RESEARCH MANUFACTURING DIVISION

Figure 53 (Page 1 of 1)  
DTE-12  
Page 1

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 May 1967

SS-1759-R  
Data Sheet  
2 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2  
S/N 22323

NAA REF. SPEC. ME 004000022323

Proof Pressure Test (Nitrogen Gas Test Fluid): 1-12-68 (A) Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): 1-12-68 (N/A) Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	N/A
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	N/A
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	N/A

Maximum Output Voltage Test: Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	N/A

Interim Change Notice Letter: F  
 ATP No.: SS-1759-R  
 Effective Date: 22 May 1968

SS-1759-R  
 Data Sheet  
 4 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
 STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2  
 S/N 22323

NAA REF. SPEC. ME NASA 004000022323

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	
	Output voltage	vdc	+1.2500 ±0.2000	
11f	Pressure (PS2)	In. Hg abs	1.0 ±0.5	
11g	Output voltage	vdc	+1.2500 ±0.2000	
11h	Specimen pressure	mm Hg abs	5.171	X
13b	(1) Specimen pressure	mm Hg abs	5.171	
	(2) Output voltage	vdc	+1.2500 ±0.2000	
	(3) Pressure PS2	In. Hg abs	1.0 ±0.5	
	(4) Time at test	hours	3	

Input Voltage Variation Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

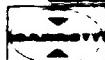
INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586		+25.0 ±0.1		0.0000 ±0.2000	
		+30.0 ±0.1		0.0000 ±0.2000	X/A
12.929		+25.0 ±0.1		+5.0000 ±0.2000	
		+30.0 ±0.1		+5.0000 ±0.2000	X/A

Output Ripple Test: Accept \_\_\_\_\_ Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mV rms	10 max	X/A

Isolation Resistance Test: Accept A Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	100 min	$7.5 \times 10^3$



AEROSPACE MANUFACTURING DIVISION

Figure 55 (Page 3 of 4)  
 DTD-7  
 Page 3

Interim Change Notice Letter: F  
ATP No.: SS-1759-R  
Effective Date: 22 JULY 1968

SS-1759-R  
Data Sheet  
5 of 5

ACCEPTANCE TEST DATA SHEET (CONT)  
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2  
S/N 22323

NAA REF. SPEC. ME NASA 004000022223

Insulation Resistance Test: 1-12-68  Accept  Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	
Resistance	Megohms	50 min	$2.0 \times 10^5$

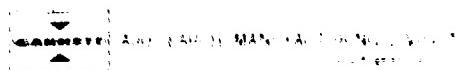
Weight: \_\_\_\_\_ lb.

Remarks: \_\_\_\_\_

Test Specimen Status:

Accept  Reject  
By P. K. Ulrich

Inspection: AIR Research Q.C. NAA Q.C. DCAS-QAR



Interim Change Notice Letter: F  
ATP No.: 88-1759-R  
Effective Date: 22 May 1987

88-1759-R  
Data Sheet  
1 of 5

## **ACCEPTANCE TEST DATA SHEET**

**Use black ink. No  
erasures permitted.**

**STEAM DUCT PRESSURE TRANSDUCER 837036-2 - 1**

NAA-NSE. SPEC. ME NASA 004000025323

Part Number 837036-2-1 S/N 22-323

Date 1-16-68 Barometer 28.9 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

**Examination of Product:** Accept \_\_\_\_\_ Reject \_\_\_\_\_

Remarks: \_\_\_\_\_

Dimensional Check Verified: 1-16-68

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 32112 Reject \_\_\_\_\_

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0680
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2210
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4900
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.7300
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9500
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7300
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4870
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2100
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0740



APPENDIX A

This Appendix contains:

ELECTROMAGNETIC INTERFERENCE TEST  
REPORT FOR P/N 857036-2, S/N 22321,  
DATED 12-2-67 (15 PAGES)



## ENGINEERING TEST DATA

Type Test CONDUCTED INTERN Page ①  
38VAC CURRENT PROBE

Part No.	837036-2	Cust. and No.	A1 RESEARCH
Serial	1/N 22321	Specification	S.S.-1323-R
Project		Test Order	10741
Conducted by	N. Harting	Approved/Witnessed by	
Date	12-2-67	Date	
Miscellaneous	NM 40A 1/N 352-10 CPL DUE 1-27-68		

Test and Requirements: steady state mode of operation.  
EGT PTF Vac. Gauge reading: 10 mm of mercury. Cal. due 12-25-67  
output 4V DC.

## BROAD BANDS.

## READING IN DB/1μA/MC

FREQ IN CPS	METER INDICATED DB	ATTENUATOR FACTOR DB	CORRECTION FACTOR DB/ME	CORRECTED VALUE DB/1μA/MC	Spec LIMIT
- 30 15000 cps.	20	20	8+34	76	100
+ 30 15000 cps.	19	20	2+34	75	100

NO NARROW BAND READINGS DETECTED



**GENISCO  
TECHNOLOGY  
CORPORATION**

## **ENGINEERING TEST DATA**

Type Test Conducted Page ②  
CP 28VDC INPUT

Part No. 837036-2 Cust. and No. P1 RESEARCH  
Rating S/N 22321 Specification SS - 1313 - R  
Project  Test Order 10741  
Conducted by N. Horning Approved/Witnessed by   
Date 12-6-'67 Date   
Miscellaneous NM10A S/N 239-15  
C&E due 2-1-'68

Test and Requirements: \_\_\_\_\_ steady state mode of operation  
output 4VDC

Vacuum gauge reading: 10 mm of mercury

Calibrated: 10-24-67. Due: 12-25-67

## BROADBAND

FREQ IN KC	METER INDICATED	ATTENUATOR FACTOR	CORRECTION FACTOR	CORRECTED VALUE	spec limit
15	3	0	91.5	94.5	154
26	3	1	79.5	82.5	143
30	3	-	77.5	80.5	140
50	4	-	71.0	75.0	129
60	8	-	69.0	77.0	125
100	21	-	60.5	81.5	114 <sup>1-4</sup>
120	21	-	59.5	80.5	110
140	15	Y	57.5	74.5	106
150	11	0	59.0	70.0	105

15	3	0	91.5	94.5	154
26	2	1	79.5	81.5	143
30	2	1	77.5	79	140
30	4	1	71.2	73.0	129
60	7	1	69.5	74.0	125
100	21	1	68.5	61.5	114
120	22	1	59.5	81.5	110
140	15	1	59.5	74.5	106
170	11	0	59.0	74.0	105



## ENGINEERING TEST DATA

Type Test Conducted Page (3)  
Current Probe Model Input

Part No. 837036-2

Cust. and No. AIR RESEARCH

Rating 2/N 22321

Specification SS -1313-2

Project

Test Order 10741

Conducted by H Horning

Approved/Witnessed by

Date 12-6-67

Date

Miscellaneous

NM10 A. A/N 250-20. Cal due

Test and Requirements

Steady state mode of operation  
output 4 VDCVacuum gauge reading : 10 mm of mercury  
Cal. due 12-25-67

Harmonics reading

Freq in KC.	meter readings	ATTENUATION FACTOR	CORRECTED VALUE	Spec Unit
+ line A	19	21	0	21
	32	10	↑	10
	58	5	↓	5
	114	16	0	16
<hr/>				
Return line B	19	21	0	21
	33	10	↑	10
	58	3	↓	3
	112	16	0	16



ENGINEERING TEST DATA

Type Test CONDUCTOR LINES Page 4  
28VDC LSN

Part No.	837036-2	Cust. and No.	AIR SEARCH
Rating	1/N 22321	Specification	SS-1313-R
Project		Test Order	10741
Conducted by	N. Horsting	Approved/Witnessed by	
Date	12-2-67	Date	
Miscellaneous	NM-20B A/N 235-19 Cal. due 2-27 '68		

Test and Requirements

steady state mode of operation

Output 4 VDC

vacuum gauge reading: 10 mm OF MERCURY

Calibrated: 10-24-67, DUE 12-25-67

BROAD BAND READING

FREQ IN MC	1A INPUT LINE METER READING DB	-D INPUT LINE METER READING DB	ATTENATOR LSN FACTOR	CORRECTED LINE DB	SPECIFIC		1313 R SPEC LIMITS
					A	D	
.15	14	13	0	49.5	63.5	62.5	115
.25	19	19	1	45.5	61.5	61.5	108
.30	18	18	1	45	63	63	106
.50	18	17	1	43	61	60	99
.60	24	22	1	41	66	61	97
1.00	15	13	1	42	57.5	55	90
1.25	20	18	1	41.5	61.5	59.5	89
2.00	7	6	1	41.5	48.5	47.5	81
2.50	12	10	1	41.5	53.5	51.5	81
4.00	11	13	1	40.5	51.5	53.5	
5.00	15	15	1	40.5	55.5	55.5	
6.00	13	15	1	40.5	53.5	55.5	
10.00	14	15	1	34.5	53.5		
13.50	12	13	1	32.5	53.5		
20.00	9.12	7.2	1	32.5	52.5	52.5	
22.50	9	7	1	39.5	47.5		
25.00	5	6	0	42.5	45.5	42.5	81

NO. OF APPROX BAND READINGS

1213.72



## ENGINEERING TEST DATA

Type Test Radiated Power. Page 5  
28VDC input

Part No.	837036-2	Cust. and No.	AIR RESEARCH
Rating	S/N 22321	Specification	S.S.
Project		Test Order	10741
Conducted by	M. Hershing	Approved/Witnessed by	
Date	12-4-'67	Date	
Miscellaneous			

Test and Requirements: steady state mode of operation  
 output 4V DC  
 vacuum gauge reading 210 mm of. mercury  
 Gauge cal due: 12-25-67

FREQ in KC.	METER INDICATED DB	ATTENUATOR FACTOR DB	Antenna Correction Factor DB/MHZ	Corrected value DB/mw/MHZ	spec. limits
15	9	0	78.5	87.5	97
26	3	↑	71.5	74.5	92
35	4	↑	69.5	73.5	89.6
40	6	↑	69.0	75.0	88
65	11	↑	66.5	77.5	84
100	8	↑	65.5	73.5	80
125	5	10	65.5	70.5	79
→	→	→	→	→	

Broadband

Narrowband

19	35	20	-	55	78
39	25	0	-	25	68.3
77	23	20	-	43	56
136	23	20	-	43	51.2

Scanning from 15Kc - 150Kc, readings were found at the indicated frequencies.



ENGINEERING TEST DATA (6)

Type Test RADIATED Page \_\_\_\_\_  
BROADBAND

Part No. <u>837036-2</u>	Cust. and No. <u>AIR RESEARCH</u>
<u>S/N</u> <u>22321</u>	Specification <u>SS-1312-R</u>
Project	Test Order <u>10741</u>
Conducted by <u>N. Norberg</u>	Approved/Witnessed by _____
Date <u>12-4-'67</u>	Date _____
Miscellaneous <u>NM 20 B 7N .35-19</u>	<u>CAL DUE 2-27-68</u>

Test and Requirements: READING TAKEN 1 FOOT FROM TEST SAMPLE  
USING 41" ROD ANTENNA AND GROUND STRAP  
CONNECTED TO GROUND PLANE AND METER  
ALL BROADBAND READINGS  
NO CW(NARROWBAND) INTERFERENCE DETECTED

FREQ. MHz	METER INDICATED DB	ATTENUATOR FACTOR DB	CORRECTION FACTOR DO INTO FB/mv/MHz	CORRECTED VALUE	SPEC. LIMIT
.15	13	0	419.5	62.5	77
.20	18	↑	45.5	63.5	75.2
.30	19	↓	45.0	64.0	73
.50	21	↓	43.0	64.0	70
.60	17	↓	42.0	59.0	70
1.00	13	↓	42.0	55	67.1
1.25	13	↓	41.5	54.5	69.3
2.00	16	↓	41.5	57.5	68.9
2.50	16	↓	41.5	57.5	68.5
4.00	11	↓	40.5	51.5	68
5.00	14	↓	40.5	54.5	68
6.00	14	↓	40.5	54.5	67.6
10.00	15	↓	40.5	55.5	67.0
13.50	12	↓	40.5	52.5	66.9
20.00	12	↓	40.5	52.5	66.2
22.50	7	↓	40.5	47.5	66.5
25.00	6	0	40.5	46.5	66.00

steady state mode of operation  
output 4 VDC  
vacuum gauge reading: 10 mm. of mercury  
Gauge cal. due: 12-25-67



## ENGINEERING TEST DATA

Type Test Radiated INIERE Page 7  
2812C INPUT

Part No. 837036-2 Cust. and No. AIRSEARCH  
Rating A/N 22321 Specification SSS-1313-R  
Project Test Order 10741  
Conducted by M. Husting Approved/Witnessed by \_\_\_\_\_  
Date 12-4-'67 Date \_\_\_\_\_  
Miscellaneous NM20B 1/N 235-19  
CAL DUE 2-27-'68

Test and Requirements: 41" RAD. ANTENNA

Scan From .15 MC TO 25 MC

## NARROWBAND READINGS

FREQ IN MHZ	METER INDICATED DB	ATTENUATOR FACTOR 0.31 MHZ	CORRECTED VALUE DB/1KHz MHZ	1313 R SPEC. LIMITS
.29	37	0	31	23
.33	35	1	35	
.6	32		32	
.9	27		27	
1.2	26		26	
1.95	23		23	23
2.35	17		17	
3.55	12		12	22.5
4.00	10		10	22.0
8.00	11		11	19.7
9.8	21		21	19.0
16.5	16	0	16.5	17.4
24.0	7		7	16.0

15 Oct. 68

NOTE After disconnecting the Simpson 204 leads, radiation from the leads can be seen and therefore, the narrowband signals are detected anymore, while scanning through the frequency range .15 - 25 MHz.



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ENGINEERING TEST DATA

(P)

Type Test RADIATED INTERF Page

BROADBAND

2VDC INPUT

Part No. 837036-2

S/N Rating 22321

Cust. and No. AIR RESEARCH

Specification SS-1313-R

Project

Test Order 10741

Conducted by N. Hastings

Approved/Witnessed by

Date 12-4-'67

Date

Miscellaneous NM 30A 1/N 240-28, CAL. DUE 2-14-'68

Test and Requirements: USING 35 MC DIPOLE ANTENNA 1 FOOT AWAY  
FROM TEST SAMPLE.

steady state mode of operation

output: 4VDC

Vacuum gauge reading: 10 cm of Hg  
Cal. due: 12-25-'67

BROADBAND READINGS

FREQ IN MC	METER INDICATED	ATTENUATOR FACTOR DB	CORRECTION FACTOR DB/MHZ	CORRECTED VALUE DB/450/MHZ	CS 1313 R SPEC LIMIT
30	0	0	20+8	28	47
40	5	-	-	33	50.4
50	0	-	-	28	51
80	13	-	-	41	52.6
120	3	-	-	31	54
160	10	-	-	38	54.5
250	16	-	-	44	56
300	17	-	-	45	56.8
350	17	-	-	45	57
400	17	-	28	45	57.5

NO CW DETECTED FROM 25 - 400 MC

NM 52 1/N 376-13, Cal. due 12-12-'67  
No CW detected freq 400 - 1000 MC



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ENGINEERING TEST DATA

Type Test CONDUCTED CP Page 9  
21VDC

Part No. 837036-2 Cust. and No. HIRE SEARCH  
Rating D/N 22 321 Specification SS - 1313 - R  
Project Test Order 10741  
Conducted by K. Johnson Approved/Witnessed by \_\_\_\_\_  
Date 12-4-67 Date \_\_\_\_\_  
Miscellaneous NM20B 3/N 235-19  
Cal due 2-27-68

Test and Requirements: C.P. around each output line

With the C.P. around each output line, no narrow band signals were detected. The scanned freq range ran from .15 - 25 MC



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ENGINEERING TEST DATA

Type Test Conducted C.P. Page 10  
Interference 20DC INPUT

Part No. 837036-2

Cust. and No. AIR RESEARCH

Rating 2/W 22.321

Specification SS-13-13-R

Project

Test Order 10741

Conducted by N. Horsking

Approved/Witnessed by \_\_\_\_\_

Date 12-7-'67

Date \_\_\_\_\_

Miscellaneous 11MHz A. P/N 239-15

Cal. Due 2-1-'68

Test and Requirements:

C.P. ground each one of output lead.  
steady state mode of operation  
vacuum gauge reading :10 mm of mercury  
Gauge Cal. due :12-25-'67

FREQUENCY MHz	INDICATED BROAD BLUE		ATTENUATION FACTOR	CORRECTION FACTOR	CORRECTED VALUE		SPEC LIMIT
	BROAD	BLUE			BROAD	BLUE	
14	0	2	0	91.5	91.5	93.5	156
20	2	0	1	84.0	86.0	84.0	148
26	2	0		79.5	81.5	79.5	143
40	2	1		74.0	76.0	75.0	134
60	0	0		69.0	69.0	69.0	124
80	10	9		64.5	74.5	73.5	118
100	8	8		62.5	70.5	70.5	114
125	0	1		60.5	60.5	61.5	108.5
150	2	1	0	59.0	61.0	60.0	104.5

BROAD BAND READINGS

No narrowband signals detected



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ENGINEERING TEST DATA

Type Test CONDUCTED Page 11  
SUSCEPTIBILITY

Part No.	837036-2	Cust. and No.	A1 RESEARCH
Rating	2/N 22321	Specification	SS 1313-R
Project		Test Order	10741
Conducted by	H. Horsting	Approved/Witnessed by	
Date	12-1-'67	Date	
Miscellaneous			
<p>Test and Requirements: SIGNAL FED THROUGH BOTH LISN ON INPUT LINE Steady state mode of operation vac. gauge reading : 10 mm of mercury gauge cal. due 12-25-'67</p>			
<p>TYPE 545A OSCILLOSCOPE A/N 033091 CAL DUE 3-18-'68</p>			
<p>RESULTS: NO CHANGE IN OUTPUT RIPPLE NO CHANGE IN DC OUTPUT LEVEL</p>			
<p>SIGNAL GENERATORS.</p>			
(1)	606 OR SG-582/0 2/N A 153. CAL DUE 2-7-'68		
(2)	MODEL 606. 2/N 712-00548 CAL. DUE 5-22-'68	Test conducted over the freq. range of 0.15-10 GHz	
(3)	MODEL 612A 2/N 533-04704 CAL DUE 3-15-'68		
(4)	MODEL 614A 2/N 214-03092 CAL. DUE 4-10-'68		
(5)	MODEL 616B 2/N 148-01241 CAL. DUE 4-11-'68		
(6)	MODEL 620A 2/N 216-02566 CAL. DUE 4-11-'68		
(7)	MODEL 628B 2/N 151-02920 CAL. DUE 3-13-'68		



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ENGINEERING TEST DATA

Type Test Audie Page 12  
oscillability

Part No. 837036-2

Cust. and No. Mr. Research

Rating 2/N 22321

Specification SS 13.13-R

Project SAC Johnson

Test Order 10741

Conducted by M. H. Hising

Approved/Witnessed by \_\_\_\_\_

Date 12-7-'67

Date \_\_\_\_\_

Miscellaneous \_\_\_\_\_

Test and Requirements:

JK

no change in output waveform (DC and ripples)	
Type 545 oscilloscope	
S/N 033091	
Cal. due 2-3-68	
Model 4001 vacuum tube voltmeter	
S/N 41-00201	
Cal. due 1-12-68	
Audio Isolation transformer	
Mc. Intosh Amplifier	
612 oscillator	
Initial state mode of operation Power output setting 10 amperes if necessary Output voltage 11.625 Input 28 VDC	

Type Test RF Radiated Page 13  
susceptibility

Part No. 837036-2 Cust. and No. AIR RESEARCH  
Rating P/N 3-2-32-1 Specification SS 1313R  
Project Test Order 10741  
Conducted by M. Hartung Approved/Witnessed by \_\_\_\_\_  
Date 12-7-67 Date \_\_\_\_\_  
Miscellaneous \_\_\_\_\_

Test and Requirements: Standy state mode of operation  
Output 44 V DC

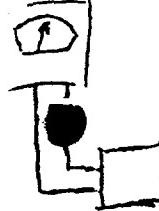
Vacuum gauge reading : 10 mm of mercury  
Gauge Cal due : 12-25-67

FREQ in	METER INDICATED	ATTENUATOR FACTOR		
			<u>FREQ. COVERED FROM 0.15 MHZ - 10 GHZ</u>	
			<u>no change in output conditions</u>	
			<u>SIMPSON VOM</u>	
			<u>TYPE 545A OSCILLOSCOPE</u>	
			<u>P/N 033091 CAL DUE 3-18-68</u>	
			<u>SIGNAL GENERATORS</u>	
①	606 OR 56-52214	P/N N153	CAL DUE 2-7-68	
②	MODEL 618A P/N 710-00348	P/N <del>710-00348</del>	CAL DUE 5-22-68	
③	612A P/N 533-04704	CAL DUE 3-15-68		
④	614A P/N 211-03092	CAL DUE 4-10-68		
⑤	616B P/N 172-01241	CAL DUE 4-11-68		
⑥	620D P/N 216-02566	CAL DUE 4-11-68		
⑦	" 618'3 P/N 151-02920	CAL DUE 3-13-68		
			<u>ANTENNA'S : All the antennas specified in Spec. SS-1313-R</u>	

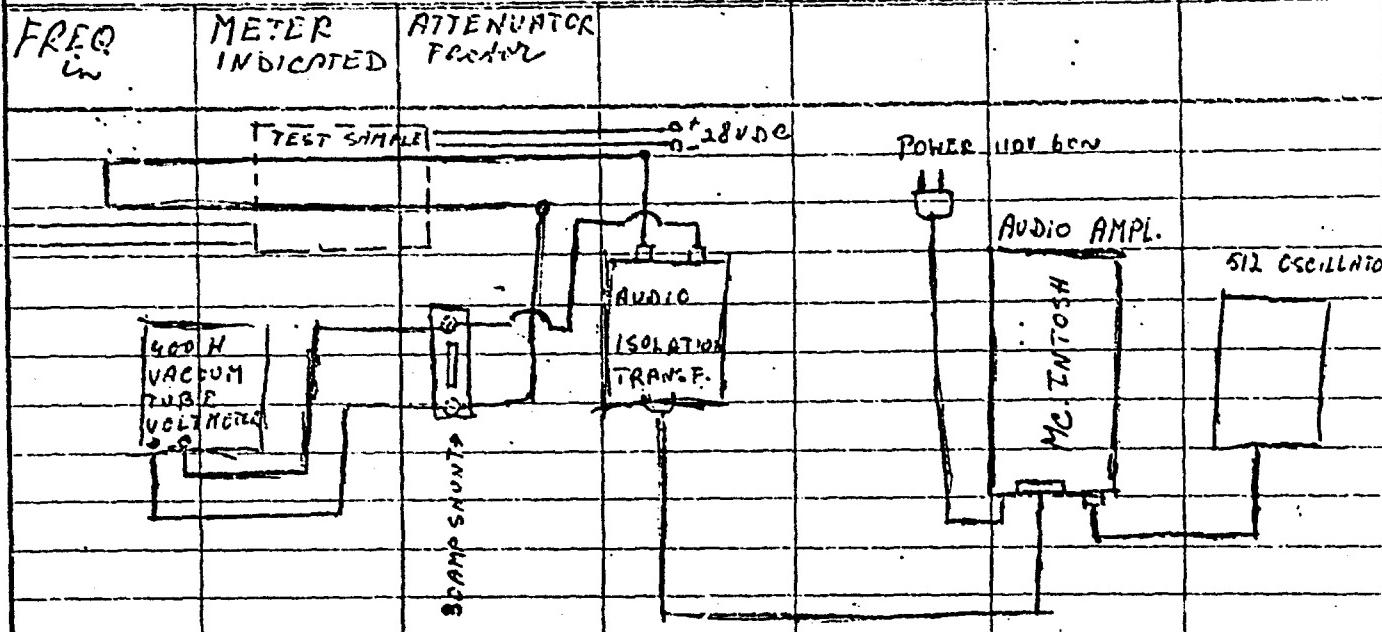
Type Test AF induced  
 susceptibility Page 14

Part No. 837036-2 Cust. and No. AIR RESEARCH  
 Rating 10V 20.321 Specification SS 1313 R  
 Project Test Order 107411  
 Conducted by M. Horwitz Approved/Witnessed by \_\_\_\_\_  
 Date 12-7-67 Date \_\_\_\_\_  
 Miscellaneous \_\_\_\_\_

Test and Requirements: steady state mode of operation  
 output 4V DC  
 vacuum gauge reading ± 10 mm of mercury  
 Gauge cal. due: 12-25-67

 SIMPSON  
VOLTMETER


LOAD SIMULATOR →



**RESULT:** no change in output indication

Test specimen subjected to 800 nT magnetic field  
 wire carrying 10 Amps.

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## **ENGINEERING TEST DATA**

Type Test Transient Page 15  
Conducted Susceptibility

Part No.	837036-2	Cust. and No.	AIRSEARCH			
Rating	S/N 22-321	Specification	SS - 1313 R			
Project		Test Order	10741			
Conducted by	M. Flaxking	Approved/Witnessed by				
Date	12-7-'67	Date				
Miscellaneous						
Test and Requirements: steady state mode of operation output 4V DC vacuum gauge reading 10 mm of mercury Gauge Cal. due: 12-25-'67						
FREQ in	METER INDICATED	ATTENUATOR FACTOR				
no change in output indications						
TYPE 545A oscilloscope S/N 033091 Cal. DUE 3-18-'68						
Transient Generator supply Transient susceptibility generator batteries						
Best Available Copy						

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